EXTENSION

E FARM AND FARM HOME MAGAZINE **October–November 1962**

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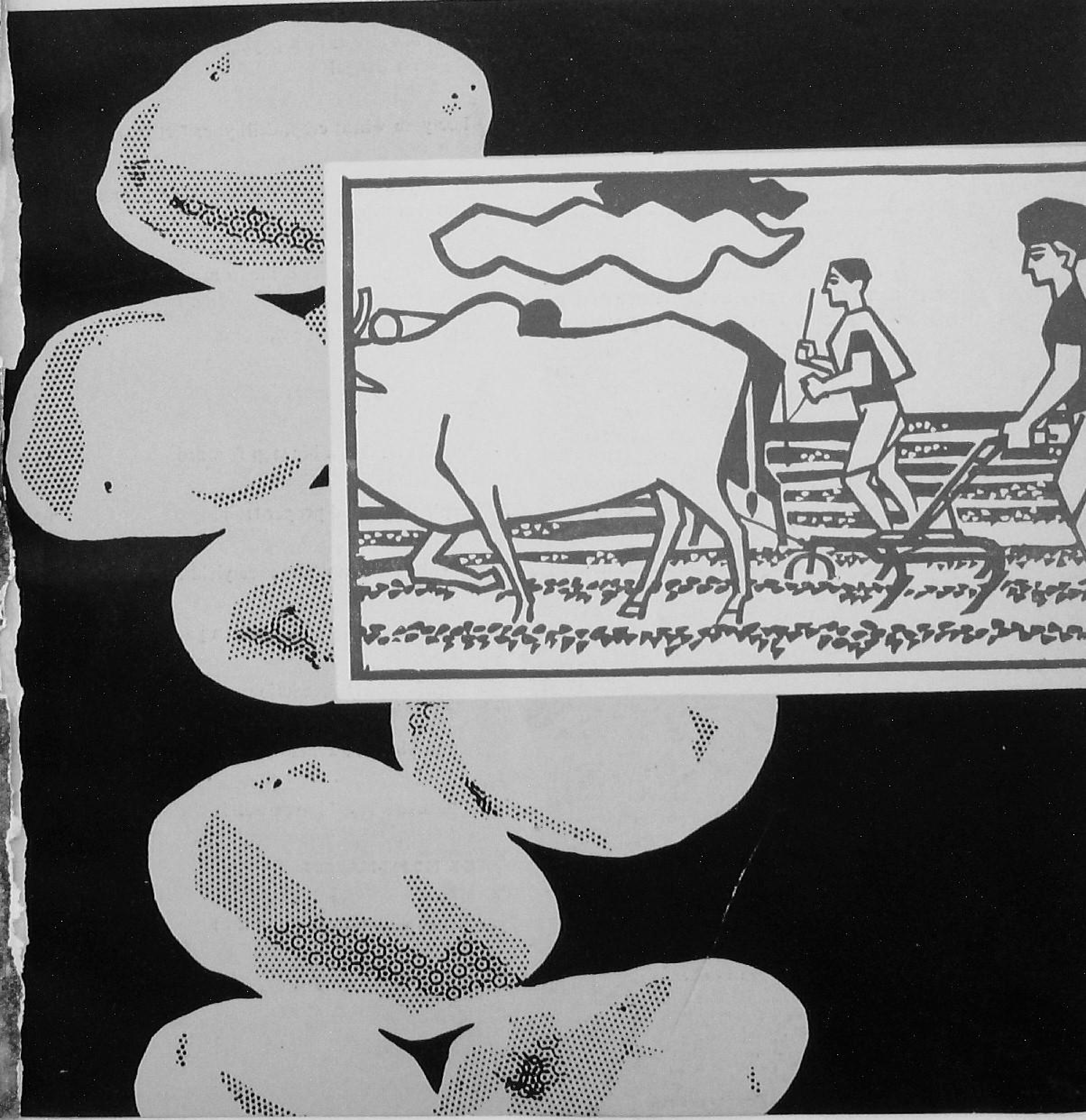

EXTENSION THE FARM AND FARM HOME MAGAZINE

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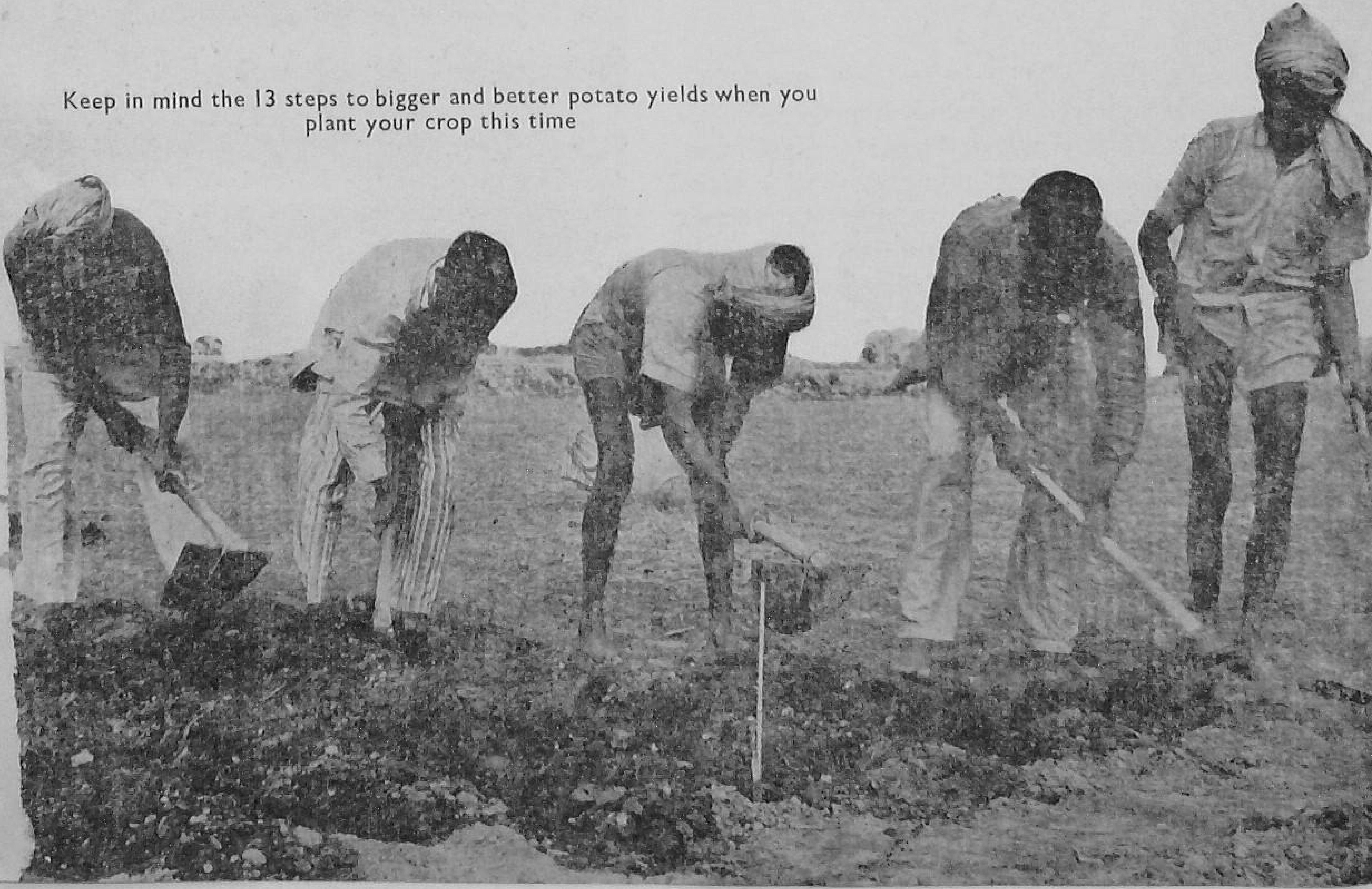
By PUSKARNATH and L. C. SIKKA

THE average yield of potato in India is only 80 maunds an acre. In advanced countries, it is as high as 220 to 300 maunds. These high yields are mainly due to the improved agricultural practices they follow. By adopting the following practices our farmers too can get equally high or even higher yields.

1. *Select a suitable soil for potato.* Although potato can be grown on all types of soil, it comes up best on well-drained sandy loam soils which are rich in humus.

Here is how POTATO YIELDS can be raised high

Keep in mind the 13 steps to bigger and better potato yields when you plant your crop this time



2. *Make sure, there is enough moisture in the soil before planting the seed.* The present practice is to plant the seed-pieces and irrigate the field thereafter. While doing so, the ridges get submerged. This results in a slower germination and rottage of the seed-tuber. So, the field becomes gappy. It has been found by experiments that an irrigation before planting (*rouni* irrigation), especially in the early crop, increases germination by 13 per cent.

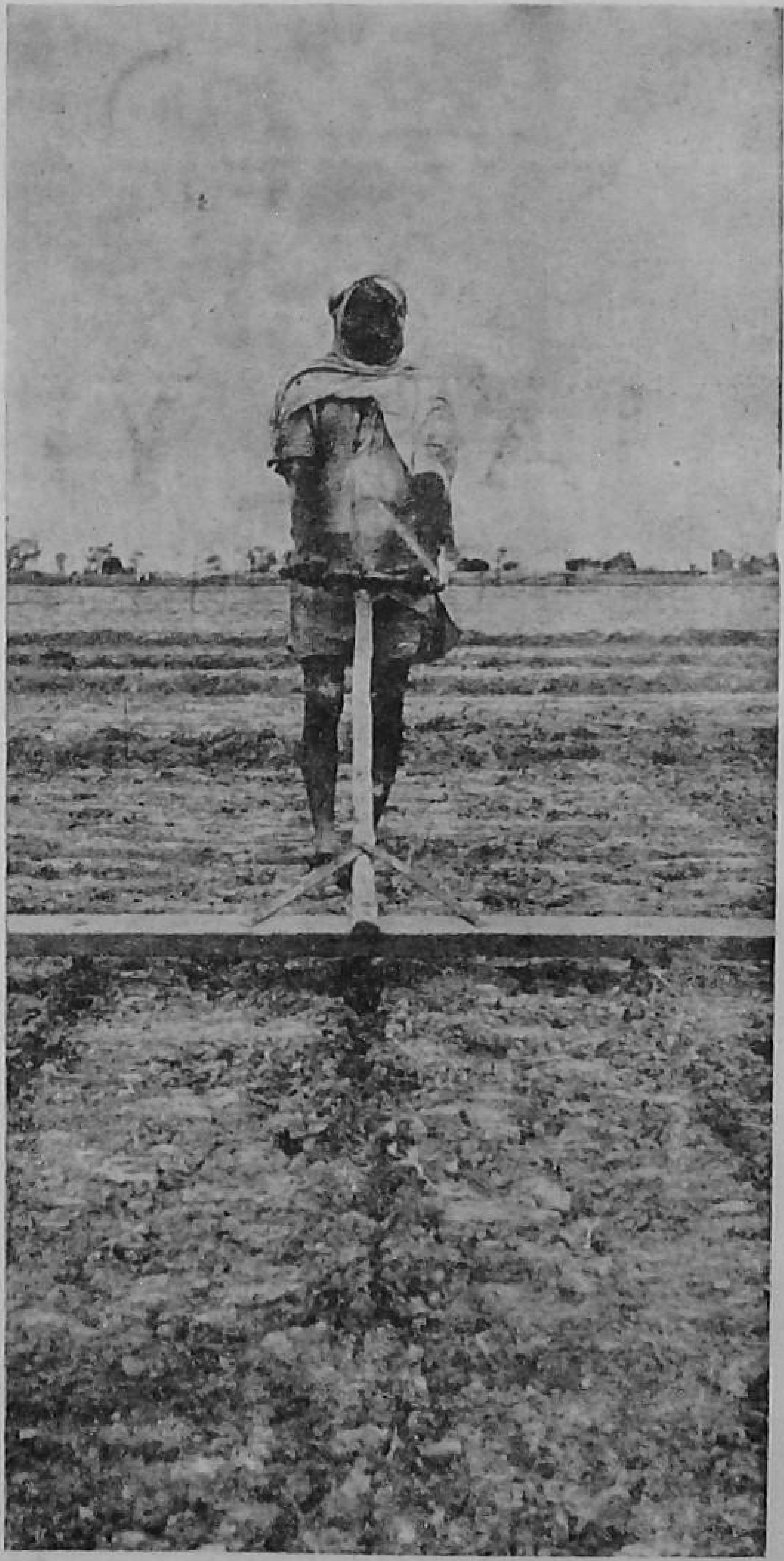
3. *Plant potato in time.* The proper season for growing potato is between October and March in the plains. So, begin planting for the early crop only at the end of September.

If you plant earlier, the stand will be poor. Some farmers plant as much as 40 maunds of seed to overcome this defect. This is unnecessary and costly. Plant in the first fortnight of October for the main crop and at any time during the first three weeks of January for the spring crop.

4. *Apply sufficient manures and fertilizers.* If your soil is a sandy loam, apply 400 maunds (15 cartloads or 4 truckloads) of farmyard manure or town compost, two to three weeks before planting. Better still, green manure the fields with sannhemp and apply groundnut cake. This will give you more yield and more profit. It is not enough if you apply only these organic manures. Potato requires nitrogen and responds to it highly. Apply 100 pounds of nitrogen (about 6 maunds of ammonium sulphate or calcium ammonium nitrate) to get optimum yields. Such application has been found to give 80 maunds or more tubers per acre.

Potato also responds to superphosphate and sulphate of potash. So, it will pay you to apply, along with 6 maunds of ammonium sulphate, 3½ maunds of single superphosphate and 2½ maunds of sulphate of potash. If you do so, your crop will be healthy ; the tubers will be bigger with firmer skin. Such tubers keep well in storage.

Draw shallow lines with a marker for planting potato at proper distances

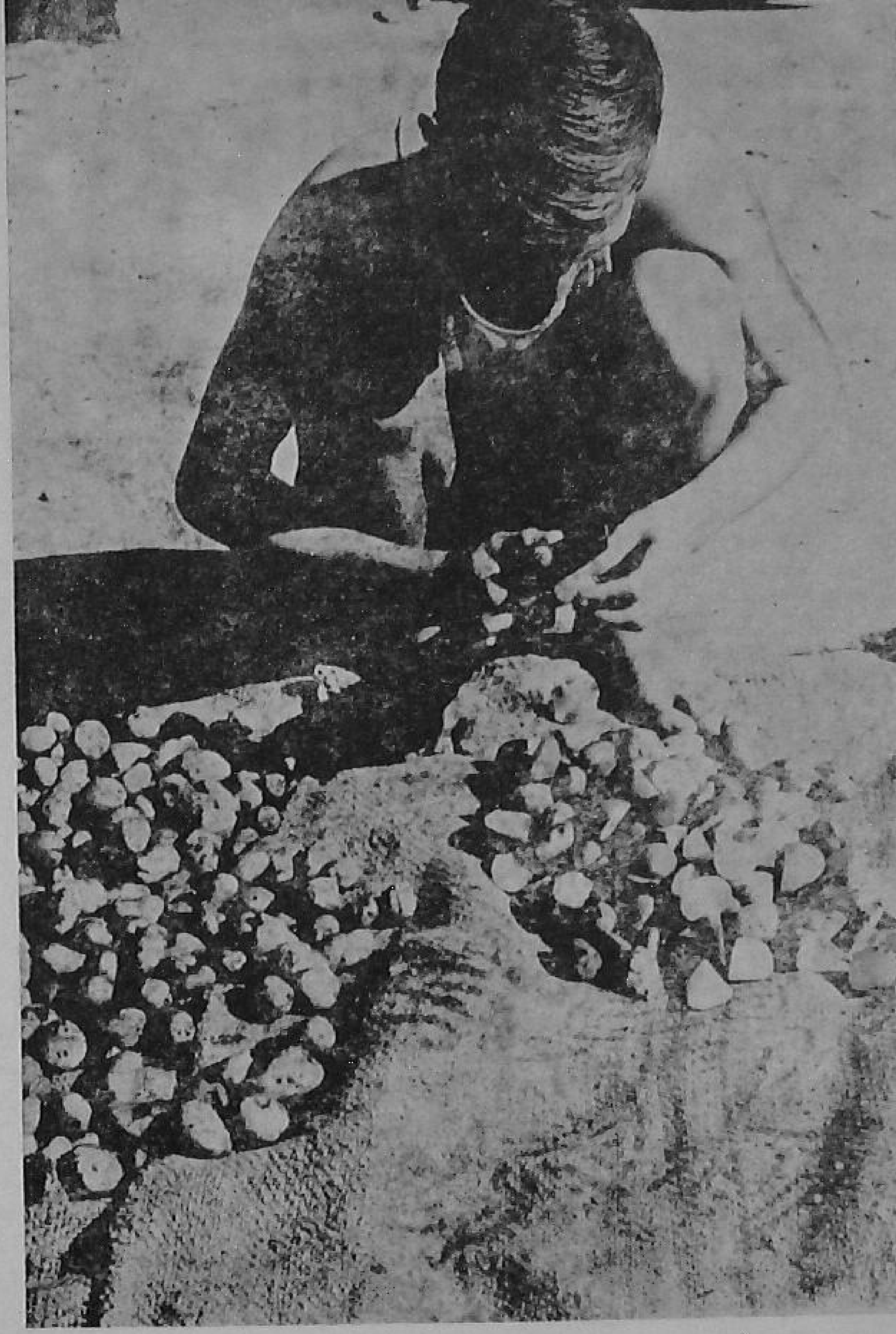


5. *Apply the fertilizers when they are most needed by the plants.* In the case of the early varieties, the crop puts on growth during the first 50 days, and during the first 75 days in the case of the late varieties. It is only after this period that the tubers begin to develop. If you apply fertilizers at the time of planting, your crop will get a good start, and put on the maximum growth which is necessary for the production of large-sized tubers.

6. *Place the fertilizers properly.* To get the full benefit from the costly fertilizers you apply, you should place them where the roots can reach them. So, apply the fertilizer-mixture in rows at a depth of three inches, that is, one inch below the seed-level. Cover the fertilizer with a one-inch deep layer of soil and then plant the seed. See that the seed-pieces do not come in contact with the fertilizer.

7. *Choose a suitable variety to suit your soil, and season.* You can choose from the following three good varieties: *Up-to-date*, *Craig's Defiance* and *Kufri Red*. The first two are early-maturing varieties and the third is a late one. *Up-to-date* matures in 3 to 3½ months. It has white, oval-shaped, large-sized, attractive tubers. It can be planted both as an early season and a main season crop. In trials, it has given a yield of 90 per cent more than *Military Special* (*Rangoon*). Some farmers feel that *Military Special* matures earlier than *Up-to-date*, because its leaves curl up earlier. This curling up of the leaves is due to a virus disease and not due to early maturity.

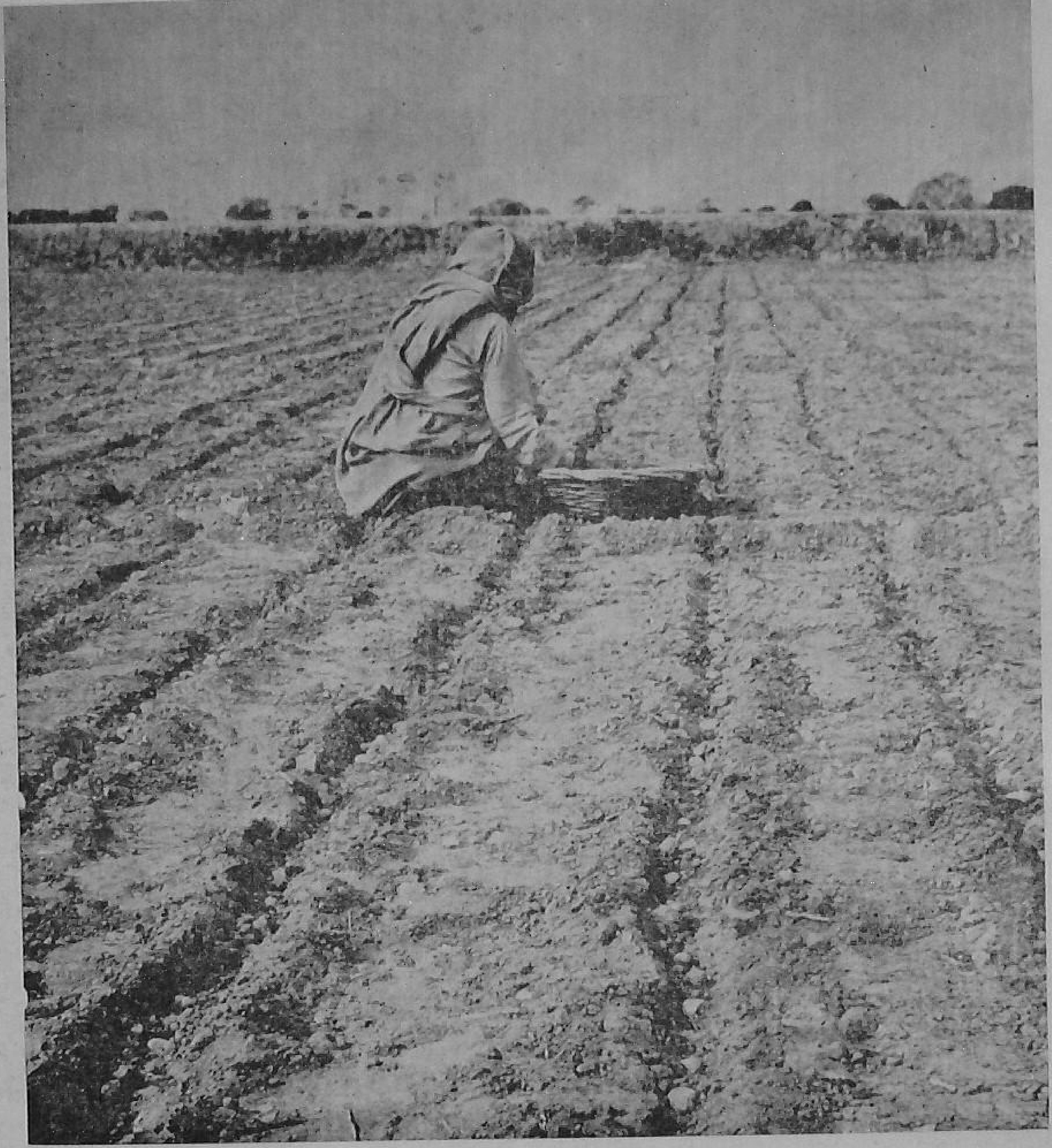
Craig's Defiance is also an early-maturing type. In fact, it is earlier than *Up-to-date* by 15 days, that is, it matures in 2½ to 3 months. Its tubers are white and large. It is best suited for planting in the main season or in the spring where temperatures are high. Do not plant it as an early crop.



Select good seed-tubers and cut them to a right size

Kufri Red is a late variety with reddish round tubers. It is best for growing as a main crop or for growing in lands where irrigation facilities are not adequate. It is a good substitute for *Darjeeling Red Round* which is infested with the serious wart disease.

8. *Plant good and healthy seed.* If you are not careful about your seed-stock, no amount of care or fertilizers will help you out later. A good potato seed should be pure, have good germination power, be free from



Apply the fertilizer-mixture in the rows, cover it with a one-inch layer of earth and then place the seed-pieces at proper distances

diseases, particularly virus and be in good physical condition.

To secure good seed,

- get your stock from a reliable merchant or a Government agency;
- renew periodically your seed-stock by obtaining fresh seed from high hills;
- avoid small-sized tubers for planting as they generally carry diseases;
- examine your seed-crop carefully once or twice during the growing season; remove and burn the virus-affected plants;
- produce your own virus-free seed. It is easy. The virus disease is carried by aphids or plant lice. These aphids are present in the plains between January and March. If there is a crop in the field during this period, aphids infest the leaves. So don't allow the plants to re-

main green after the first week of January. Kill all the haulms (shoots). Let the tubers remain in the ground till the middle of February when the cold stores start working. Transfer your seed to a cold store and use it for raising the next crop. If you do these things, your seed stock will remain free from virus for several years.

9. *Sprout the seed before planting.* Take the seed out from the cold store at least 10 days before planting. Keep it under a thatched shed or tree which gets indirect light, for 10 to 15 days. This will make the sprouts strong, thick and green. Such sprouts will emerge earlier and grow vigorously. This practice is specially helpful in the maturing for the early crop.

See for yourself how improved cultural practices help you reap a rich harvest like this one

10. *Adopt a suitable seed-rate.* For *Up-to-date*, plant 25 to 30 maunds of tuber per acre. For *Craig's Defiance* you may use 35 maunds. For small-tubered varieties like *Kufri Red*, 16 to 20 maunds are sufficient

11. *Plant the seed properly.* Experiments have shown that the Jullunder method of planting potatoes gives 12 to 30 per cent more yield than any other method. In this method you draw shallow rows by means of hand-drawn markers. Then spread the fertilizer-mixture uniformly in these rows and mix it with the soil with the help of twigs. Place the seed-pieces at proper distances and cover them with a layer of four to five inches of earth by means of *khurpas* or spades.

12. *Space the seed suitably.* To get the maximum yield of potato, the number of plants in an acre should not be less than 26 to 30 thousand. You can get this number if you keep a distance of 1½ feet between the rows and 9 inches between the plants for the early varieties. For the late varieties, plant the tubers 9 inches apart in rows spaced 1¾ feet from one another. By adopting these spacings you can increase your yield by 10 per cent.

13. *Lastly, irrigate with care.* Give the first irrigation after sprouting has begun. Later, irrigate at intervals of 7 to 10 days. Avoid heavy irrigations. Light but frequent irrigations help plants use the fertilizers better and give higher yields.

GROUNDNUT will be a paying RABI CROP

By K. SEN GUPTA and M. K. DAS

So far, there has not been much of groundnut-growing in West Bengal. The crop today occupies but a thousand acres of the total of 13 million cultivated acres of the State. The reason for this small area is this: groundnut being cultivated generally under rainfed conditions in *kharif*, its sowing season coincides with that of other highland *kharif* crops. Moreover, it has not been possible for farmers with small holdings to grow groundnut in place of foodgrains.

It is now found that the farmers can grow groundnut with profit in the *rabi* season with the help of irrigations.

They can sow groundnut in October-November, even up to January. When sown in October-November, they can harvest the crop in March-April. The January-sown groundnut is harvested in May.

Because groundnut can be sown from October to January, it is possible to fit it in

different crop rotations. Here are a few crop rotations suitable for adoption:

Crop	*Date of sowing*	*Date of harvest*
1. *Jowar* and maize for fodder	Early June	July end
Aman paddy	Early August	December
Groundnut	January	May
2. Early *aus* paddy	May	July
Transplanted *aus* paddy	Early August	October
Groundnut	November	March-April
3. *Aus* paddy	June	September
Tori	October	December
Groundnut	January	May
4. Jute	April	July
Early winter vegetables like radish, spinach etc.	August	October
Groundnut	November	March

When the crop is sown in January, care has to be taken in harvesting it. If good showers are received in April-May or if too much water has been given at the later stage of the crop growth, the crop will look green even in May, though the seeds would have matured. Hence, farmers should carefully see whether the pods are ripe or not and then harvest the crop.

After the nuts have been picked, the haulms can be put back into the soil. This will benefit the succeeding crop.

The following tips would be of use to the farmers when they start growing groundnut.

Select a well-drained light or medium soil.

Plough the land four to six times and about six inches deep. Remove the stubbles.

Apply 'Aldrex' at 20 pounds to the acre to control termites.

Apply compost at 2 to 5 tons per acre and superphosphate at 200 pounds per acre.

Select a good variety like *TMV 2* or *NG 70*. You will need 40 to 100 pounds of seeds per acre, depending upon the variety and the spacing adopted.

Sow in rows 10 to 12 inches apart, depending on the variety, and 6 inches between plants.

Apply a light dose of ammonium sulphate to help the crop get a good start.

Hoe twice or thrice before flowering.

Give an irrigation, two or three days after sowing, to help seeds germinate. Irrigate a few more times during the growing period. Before harvest give an irrigation if the soil is stiff.

Spray the crop with 4 to 5 pounds of 'Fytolan' mixed in 100 gallons of water per acre along with 50 per cent wettable powder DDT, at an interval of 20 to 30 days, starting from a month after seeds have germinated. This will keep the crop free of diseases and pests.

With this much attention paid to the crop, farmers should be able to get a yield of 20 maunds of groundnut per acre.

For your wheat crop

Drill The Fertilizer —Don't Broadcast It

By DHYAN SARUP

WHEAT profits can surely go up if you drill the fertilizer instead of broadcasting it.

Every cultivator can practise drilling of fertilizer without any extra expenditure. Drilling of fertilizer can be done with the help of a *pora*.

The village blacksmith can construct a *pora* very easily. It is not very complicated implement. It consists of a tube of $1\frac{1}{2}$-inch to 2-inch in diameter, and on the upper end of the tube a funnel is attached. The *pora* can be either made of tin sheet or of bamboo. Attach its handle behind the country plough and work.

You will need to employ one man and a woman if you sow wheat by this method. The man will handle the plough with one hand and with the other he will feed the *pora* with the fertilizer. The woman will sow the wheat seed behind the plough by *kara* method.

When you broadcast fertilizer, it is spread throughout the field and wheat plants cannot utilize the full dose of fertilizer as some of it is lost to weeds. Moreover, the fertilizer which remains between the rows helps in the growth of weeds.

But if you drill the fertilizer, plants will be able to utilize the full amount of the fertilizer you apply ; because while drilling, the fertilizer will be placed two to three inches below the seed-level. As the roots come out they will at once utilize the fertilizer.

Plants thus are able to grow better, yield high and produce seed of good quality.

At my own farm I have seen that where I broadcast the fertilizer I got 15 maunds of wheat per acre and where I drilled the fertilizer, I got 23 maunds of wheat to an acre.

TO OUR SUBSCRIBERS

The recent power shortage in Delhi resulted in the dislocation of the printing of our journals. That is why the September issue of EXTENSION reached you late.

In our effort to make available to you the timely information you would want to have, we have published this as a combined issue for October and November, 1962. The future issues will be sent to you well in time.

Subscribers will as usual receive 12 issues for their annual subscription. The subscription period of all subscribers who are currently on our mailing list is being extended by one month. The inconvenience caused is regretted.

Business Manager
Farm Information Unit
Directorate of Extension
Krishi Bhavan, New Delhi

WHAT YOU SHOULD KNOW ABOUT CALCIUM AMMONIUM NITRATE

By A. K. DUTT

CALCIUM ammonium nitrate (also called CAN) is a nitrogenous fertilizer like ammonium sulphate, urea, ammonium sulphate nitrate and ammonium chloride.

CAN, like ammonium sulphate, contains 20 per cent of nitrogen. Moreover, it also contains calcium (lime). While ammonium sulphate when applied makes your soil acidic, CAN produces no such bad effect. Because CAN contains lime, it is very useful for applying to acidic soils. On certain types of soils, which cause sulphide injury to crops, calcium ammonium nitrate works better than ammonium sulphate.

Calcium ammonium nitrate absorbs moisture from the air. To prevent the fertilizer from absorbing the moisture and thereby caking, it is made available to you in a specially coated pellet form.

A GOOD FERTILIZER

Calcium ammonium nitrate is as good as ammonium sulphate or urea or ammonium sulphate nitrate. It can be used on a wide range of soils, and like ammonium sulphate it can be applied both as a basal and top-dressing. However, to get the best results from this fertilizer, you must know when and how to apply it.

WHEN AND HOW TO APPLY

Apply calcium ammonium nitrate to the wetland paddy (rainfed and irrigated) as a top-dressing. Do not apply this fertilizer to the field at puddling time. If you do, a part of the nitrogen will be lost. It is better to apply it in two or three doses, instead of applying all of it at a time. This way, plants will get the nitrogen at the time they need it most. If the leaves of the crop are moist, mix dry sand or soil with the fertilizer before top-dressing. If yours is an irrigated paddy and you have control over irrigation, better drain out the field first. Apply the fertilizer and mix it with the soil, and irrigate immediately.

If you do not have any control over irrigation, apply CAN to the standing crop, as you do for a rainfed crop, and mix it well with the soil.

Apply CAN as a basal dressing during the tillage operation, before sowing or transplanting, to the soil for dry-land paddy, wheat, cotton, sugarcane, tobacco and vegetables.

When you want to apply it to a moist soil, mix it with the soil thoroughly.

If, however, the soil is dry, as under the rainfed conditions, apply the fertilizer, *but do not mix it with the soil.*

When you apply the fertilizer to a dry soil before irrigation, avoid over-irrigation to get better results.

For the specific dose of the fertilizer to be used for your crops and for any other information on the use of this fertilizer, consult your Gram Sevak or Agriculture Officer.

CAN IT BE MIXED ?

You can mix calcium ammonium nitrate with other fertilizers, *but you cannot store the mixture* for future use. Mix with other fertilizers only just before applying in the field.

HOW TO STORE

This fertilizer comes to you in small polyethylene bags of 50 kilograms each having an outer gunny cover. Once you open the bag, you have to use all the fertilizer contained in the bag. If you need but only half of it, you can share the other half with your neighbour. If you, however, want to keep the rest of it for your future use, open the bag carefully at one end, remove the fertilizer you need and seal the bag by folding the inner polyethylene cover as many times as possible, and then store. This will prevent the fertilizer from absorbing moisture from the air and caking.

REMEMBER !

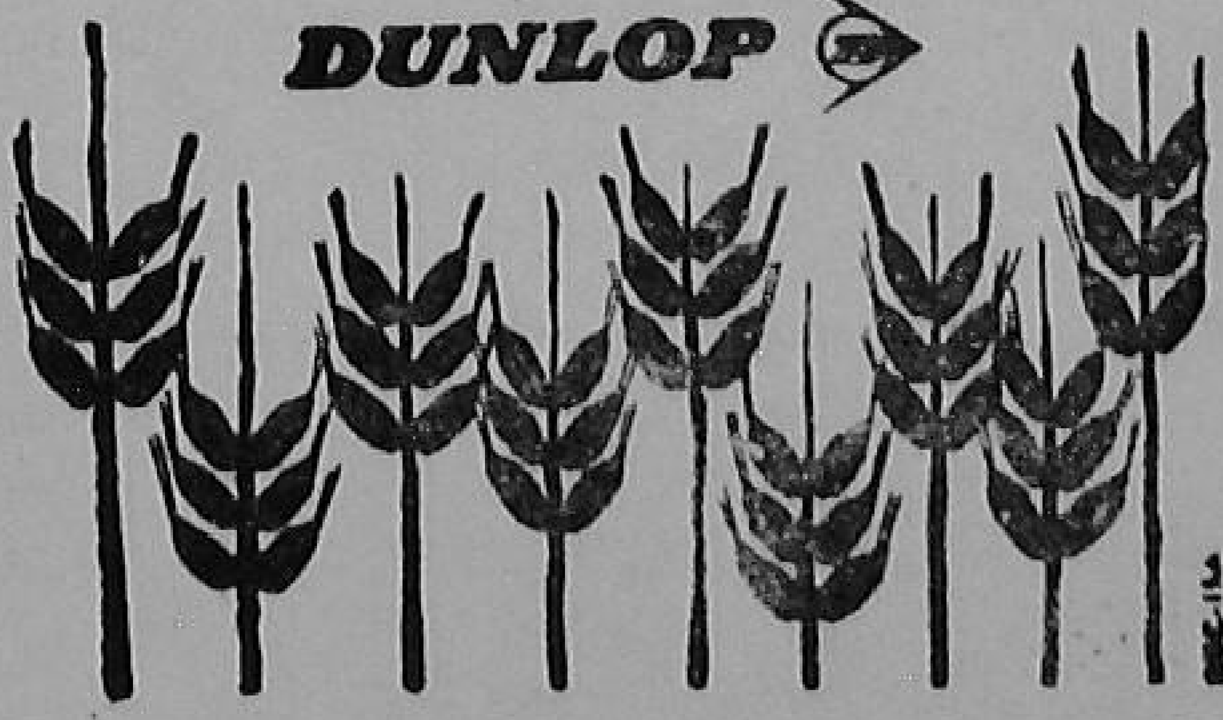
- Do not open a CAN bag until you need it for applying in the field.
- Do not forget to seal the bag carefully in case you have used only a part of the fertilizer.
- Do not allow the bags to come in contact with the damp or moist floor. Store the bags in a cool, dry place.
- Do not keep other extra weights on the bags.

This tyre lowers your farming costs

Tractor farming becomes easier with the Dunlop RT 33 open centre tractor tyre which has more tread bars to give the maximum grip on hard dry soils. This tyre reduces power loss on the tractor and enables a greater acreage to be ploughed per day.

More tractors in India are fitted with the Dunlop RT 33 Tyre than any other make

DUNLOP



BETTER CASHEW TREES COME FROM AIR-LAYERING

By V. N. MADHAVA RAO

WHY do some cashew trees yield over 200 pounds of nuts per year and others just a few pounds each ? And this happens in spite of the same care given to both !

There is a reason for this. Cashew is mostly grown from seed. The seed from even a very good-yielding tree need not produce a plant, which can give high yields like its mother plant.

To get plants with the same high-yielding quality, as that of the mother plant, farmers try such methods as layering, budding or grafting, or use cuttings. With these methods they produce plants which behave just as the mother plant does. The grower is thus able to multiply selected good types only. Trees raised by these methods also start bearing earlier than those raised from the seed trees.

Of all such methods tried, air-layering proved to be the best at the Cashew Research Station, Ullal, Mangalore (Mysore State). About 75 per cent of the air-layers grew into good seedlings.

This is how you can prepare air-layers.

- Select full-grown trees which produce a large quantity of big-sized nuts, and have started bearing early.
- Remove about 1/8th to 3/4 inch wide bark in the shape of a ring from the shoots which is pencil-thick or about a month to a year old.
- To prevent the cut portions from healing and joining together, tie a strand of coir fibre or twine over the same.
- Next, cover the treated portion with a rooting medium of moss, coir or wood shaving. Even sand will do.
- Wrap with a 5-inch by 6-inch piece of polythene film of 150 gauge ; secure the ends with twine. Such a wrapper will keep moisture for a long period and allow exchange of gases in the plant tissues. This way, the treated portion along with the rooting medium will always keep moist. It will not need watering later on.

In about 20 days, the cut ends will show a swelling. At the end of two months, roots will start coming out from the shoots. You will notice clusters of reddish brown roots with pinkish white pointed ends at the upper

edge of the ring-like cut, some of them piercing through the transparant film. These can be seen in another 20 days.

When this happens, the rooted shoot or the 'layer' is ready for separation from the parent plant. Don't separate the layers at once, but in two or three stages. After 75 days, give the first 'V' shape cut half way through the stem just an inch below the point of root growth. Give the second cut to deepen the first one a week later. After a few days, follow with the third or final cut to separate the layer from the mother plant. Where the rooting is heavy, you can separate in two stages.

Transfer the rooted layers in earthen pots or containers nine inches long and four inches in diameter in which you have put a mixture of red earth leaf mould in equal proportions. Take care to avoid injury to the root while transfering

You have to water the layers regularly during the non-rainy periods and in summers. Plant out the layers in the field during the the monsoon season—June-July, but not after July. You can plant out the layers directly in the field or after nursing them in the pots for some time.

You can prepare cashew layers any time in the year. But the periods from January to April and August to December are the best.

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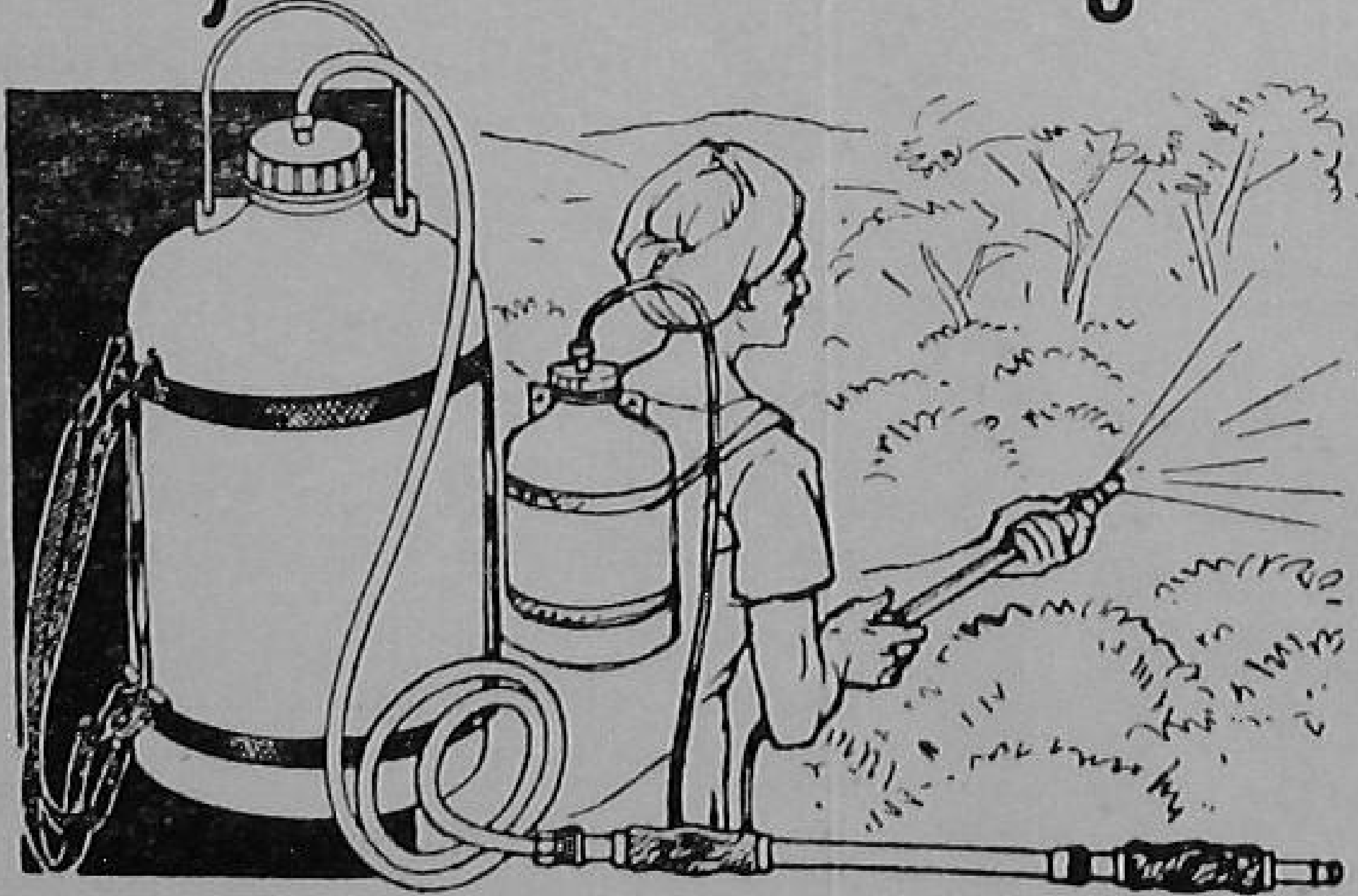
do you have four bighas land?



If you have four or more bighas of land to cultivate and protect from the ravages of pest . . . you will find the *'Holder Harriden'* **"Junior"** Sprayer indispensable.

This cheap continuous action, double-acting hand pump fitted with a 2-ft. Lance Extension, Angle Bend, 3 different nozzles, 4.5 ft. of hose and a 2 gallon light-weight (3 lbs.) plastic container, will soon pay for itself in the form of a healthy and bountiful crop.

The "Junior" Sprayer is one of the 'Holder Harriden' range manufactured by

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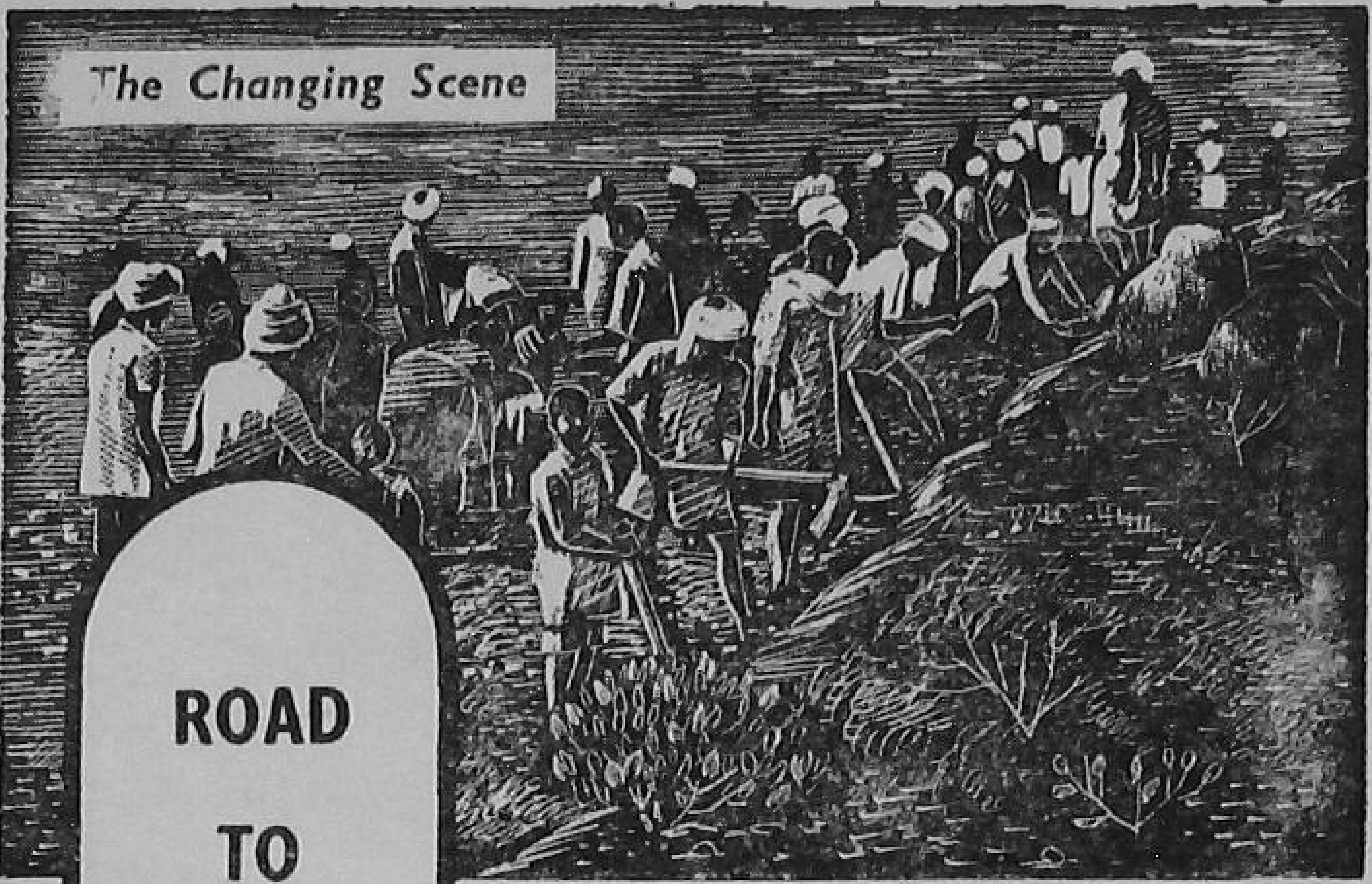
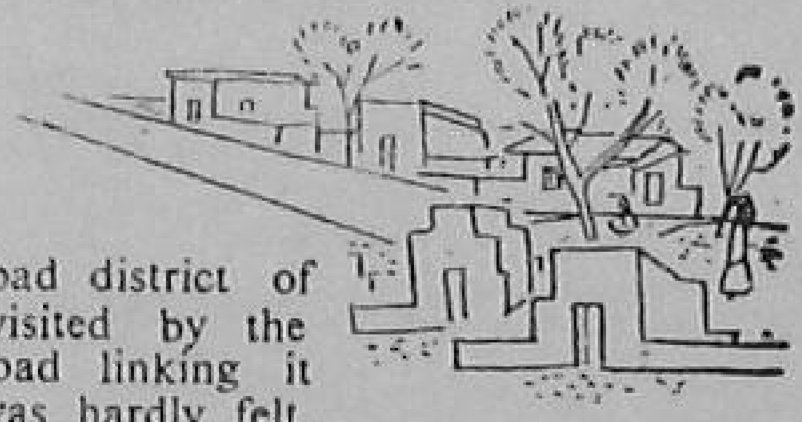
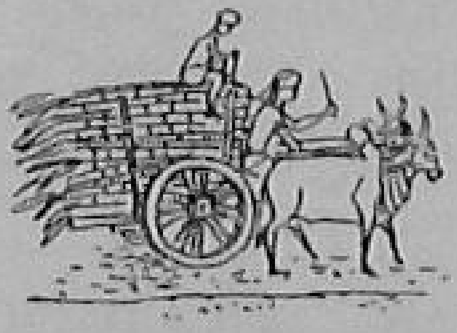


ROAD TO DADRI



DADRI—a tiny village in the Allahabad district of Uttar Pradesh lived its usual life unvisited by the wheels of progress. There was no road linking it to the world outside and the need was hardly felt.



But then started the great change. Like thousands of villages Dadri too woke to the message of planned progress. The farmers put in extra effort, the land responded to better cultivation and yielded more and more sugarcane. To transport sugarcane to the factory the village now needed a road.

The enterprising villagers of Dadri put their heads together and decided to draw the shortest line to the nearest pucca road and wherever the line passed the owner contributed land as a gift and thus the road was laid. **This was an expression of faith in the movement for development and the promise of a brighter future for everyone.**

Road building is changing the face of rural India, bringing it nearer to the highways of progress and prosperity. The mileage of unsurfaced roads rose from 1,51,000 miles to over 2,50,000 miles during the first decade of planning, while that of surfaced roads rose from 97,500 miles to 1,44,000 miles. During the Third Plan period, we hope to build another 25,000 miles of surfaced roads, apart from making considerable addition to the unsurfaced road mileage.

THIRD FIVE YEAR PLAN

A GOOD LIFE FOR EVERYONE

DA 62/408

FINDING PROTEINS FOR VILLAGE BIRDS

By K. KANTHASOMI

EXPERTS say that chicks and growing birds need 20 per cent and layers 16 per cent of protein in their feed. Out of this, 25 to 30 per cent must be of animal origin.

Getting protein foods for poultry is a real problem, however, in villages.

The villager can of course select fish-meal, blood-meal, meat-meal, milk products or insects to supply his birds with the protein they need.

Excepting insects, the other feeds will be costly, as it is not easy to get them in the village. You can, however, always get insects without any difficulty.

White-ants and maggots among insects can provide the birds with the proteins they need. And this is how you can multiply white-ants and maggots.

WHITE-ANTS

Prepare dung cakes. Dry them in the sun. Put these in any mud pot. Sprinkle water inside.

Keep the pot upside down, so that there is shade inside. You will find a rich growth of white-ants. In case you don't find any, get some white-ants and put them in the pot. They will multiply very fast.

Feed these to your birds, but do not allow the birds to drink water after they have taken the feed.

MAGGOTS

Collect some ruminal contents, i.e., half-digested material from a slaughter house. Spread it under the shade. Sprinkle some water over it and cover it with sand.

Flies will go and lay eggs there. After some time, you will find a rich growth of maggots. But protect them from crows and other birds.

Feed maggots to your birds before putting the birds in the poultry-house in the evening. But again, do not give them water after feeding them.

Feeding with white-ants and maggots helps chicks grow up quicker, layers lay more and broilers put on weight quickly.

Thus if you are keeping a few poultry birds and living in a village, you can find white-ants and maggots a good protein feed for them.

But you will have to depend on ready-to-feed balanced mash if you are keeping poultry for business.

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It may be

Respiratory Disease in Poultry

What you think to be Ranikhet or coryza in your poultry birds may not always be the disease you suspect

It is now found in many such attacks that the disease is a chronic respiratory one.

Caused by an organism, it is an air-sac infection; the common symptoms are nasal discharge, sneezing, coughing and gasping, shaking of head, and reduction of appetite. The eyes may not show swelling. Birds lose weight and death occurs, more so in the case of chicks a few weeks old. Egg production goes down in layers.

The disease is carried in the egg, and birds once infected may remain carriers for a long time.

For treatment, the best thing to do is to consult a veterinary doctor. The trachea or the breathing tube of the dead bird should be sent in ice in a thermos flask to the Poultry Research Division, Izatnagar, Uttar Pradesh, for a correct diagnosis.

Since prevention is better than cure, care should be taken to provide good ventilation and sanitation. Overcrowding should be avoided. Birds which recover should be shifted to new grounds, so that they may not get the disease again.

MAKE GRAM PAY MORE

GRAM is a popular crop in many parts of our country, especially in the Punjab. Farmers put more acres under it than they do under wheat in that State. With a little more attention, gram can be a very profitable crop too.

Here are some tips that will help you get a good gram crop.

* Plough the land deep—say up to 9 inches ; gram grows well in a deep-ploughed land.
* Usually farmers do not manure their crop. But experiments show that superphosphate helps gram give higher yields. With this fertilizer applied, you get about four more maunds of gram to an acre.
* Drill two maunds of superphosphate just before sowing, 2 to 2½ inches below the seed-level. The extra four maunds of gram that you will get will cover the cost of superphosphate, and leave you with about 35 rupees as profit.
* Select a good gram variety. There are a number of improved gram varieties. Ask your Gram Sevak or Extension Officer help you select one that is best suited to your land.

  Recently, the Punjab Agriculture Department released *C. 104*, a new variety of *kabuli* gram, for growing under irrigated conditions (except in the hill and submontane districts of Kangra, Gurdaspur and Hoshiarpur). This gram yields at least two maunds more per acre than any of the present varieties. Besides, it has bolder seeds than the local grams. Its seed is very much liked by people and as such fetches a good price—as much as Rs. 21 to 27 per maund. Apart from this, it is also resistant to wilt disease.

  For the rainfed condition, varieties *S. 26.* and *C. 235* (both for irrigated and unirrigated lands) are good.
* Sow gram in the latter part of October. *Desi* gram should be sown in the Punjab from 10th to 25th of October. Early sowing results in more vegetative growth and less of pods. The early-sown crop also gets wilt attack easily.

  Sow the seed five inches deep, in lines one foot apart. Deep sowing results in better germination of seed.
* Give a heavy irrigation before sowing, if you find that there is not enough moisture in the soil. No further irrigation need be given. If, however, the soil dries up too much later, give another irrigation between the middle of December and the middle of January.

This *rabi*, raise a paying gram crop.

Test the soil at the site itself and in only half-an-hour's time with the help of

"GUNTI" SOIL TESTING KIT

Indiscriminate application of fertilizers may not only be wasteful it may eve be detrimental to the crops "GUNTI" Soil Testing Kit eliminates the guesswork in using fertilizers.

Fairly accurate results in the determination of soil fertility and soil-re-action are obtained.

It is simple and extremely helpful.

Each Kit contains 22 items in an attractive sheet metal box consisting of re-agents for determining:—

★ SOIL RE-ACTION (pH)
and estimation of available
★ PHOSPHATES ★ NITRATES & ★ POTASSIUM
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ALSO AVAILABLE: I. A. R. I. TYPE SOIL TESTING KIT

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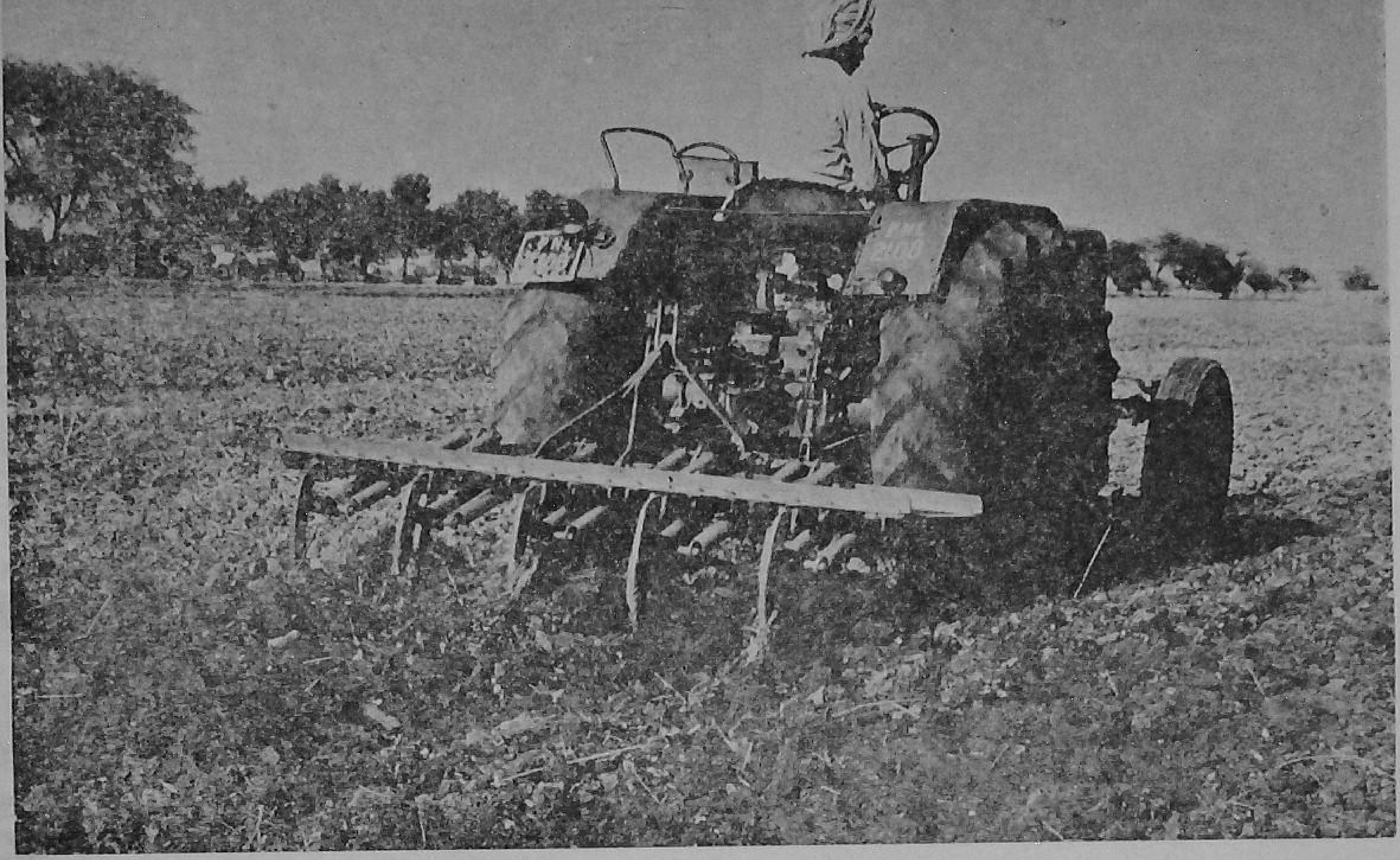


LUDHIANA TAKES A BIG STEP FORWARD

IN the Punjab, the District of Ludhiana has ample irrigation facilities and a sound cooperative structure. Moreover, the College of Agriculture and the Research Institute are located here. People in the District are highly receptive to improved farming practices. Hence, Ludhiana offered the greatest scope for undertaking the Package Programme activities.

The Programme started working in the District from *kharif* 1961 after the selection, appointment and training of the staff, were completed.

COVERAGE

In the first year, of the total of 884 inhabited villages in the District, 201 villages scattered in 9 Blocks and with a cultivated area of 1.58 lakh acres (about 22 per cent of the total cultivated area of the District) of which 73 per cent is irrigated, were selected for intensive work.

FARM PRODUCTION PLANS

An important feature of the Package Programme was the development of two types of farm plans for individual farmers, so as to enable them to secure the maximum possible yield by trying the 'package of practices'

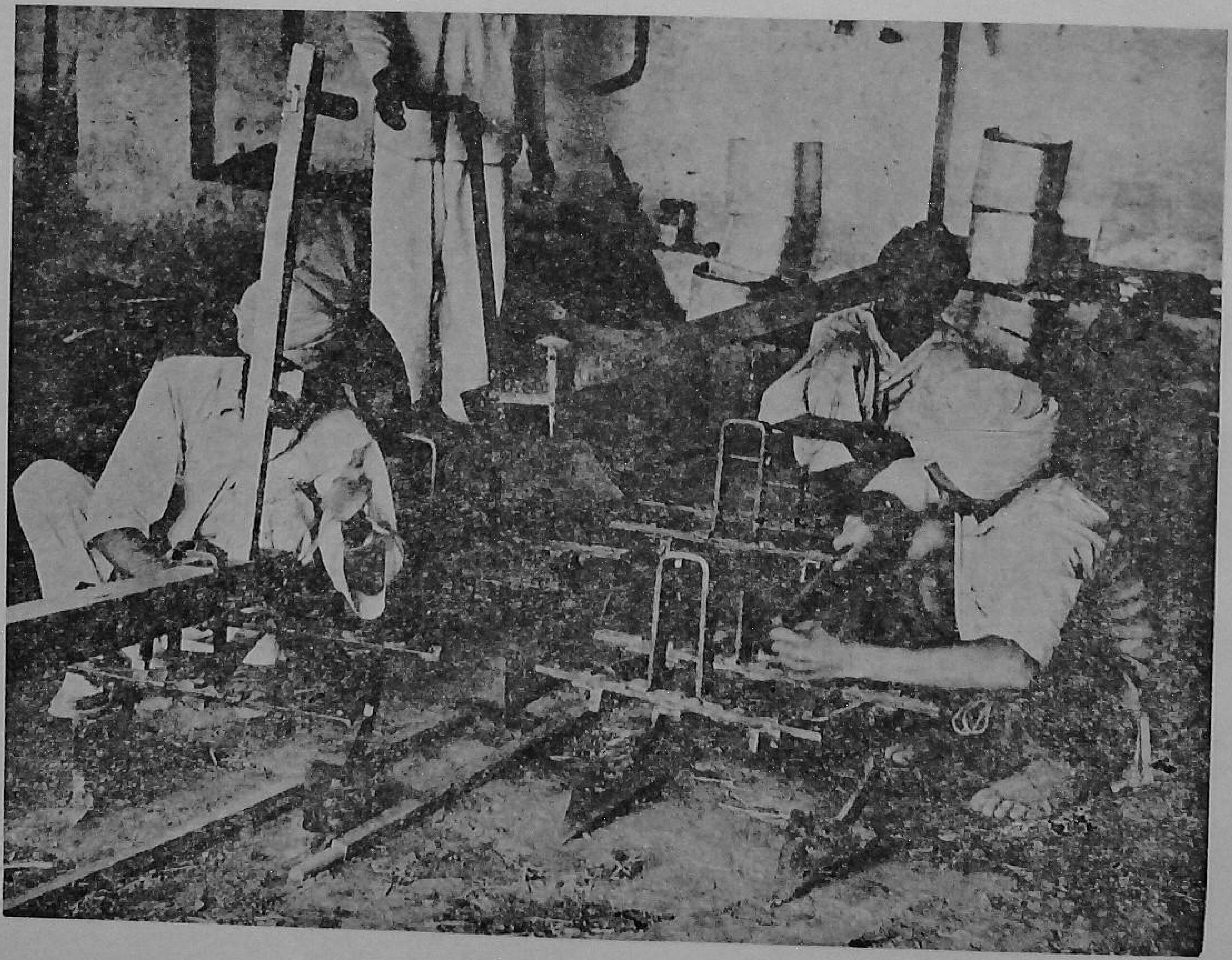
kharif season 1961-62, the following plans were prepared :

Number of production pnsal	Intensive and extensive	Crop production Plans	Total	Intensive and extensive	Crop production plans	Total
Target	3,000	—	3,000	3,000	15,000	18,000
Actually prepared	2,831	—	2,831	2,831	17,095	19,926

During 1961-62, the crop production plans covered 2,33,900 acres and involved as many as 19,926 farm families. The area covered was 36.3 per cent of the total cultivated area in the District.

In 1962-63, as many as 45,000 more farm families are to be helped with the crop production plans for the *kharif* and *rabi* seasons, separately. In addition, each Agricultural Extension Officer will develop 12 model farm plans, 25 farm plans and 2 *panchayat* land farm plans. Village agricultural plans for 606 villages will also be prepared. The target set for 1962-63 will cover 65 per cent of the farm families in the District.

Villagers are being trained in the repair and use of improved implements



FERTILIZER USE

The average per-acre consumption of fertilizers was 12.80 pounds prior to the introduction of the Package Programme and this was pushed upto 43 pounds per acre during the first year of the Programme. The increase in fertilizer consumption in the District is seen below.

	Quantities needed during 1961-62	*Quantities used up to 31-3-1962*
Ammonium sulphate	7,333 tons	11,383 tons (Ammonium sulphate and Calcium ammonium nitrate together)
Calcium ammonium nitrate	2,214 tons	
Superphosphate	1,000 tons	2,001 tons
Potash	440 tons	16 tons

During 1962-63, it is proposed to supply fertilizers of all kinds to the extent of 22,158 tons.

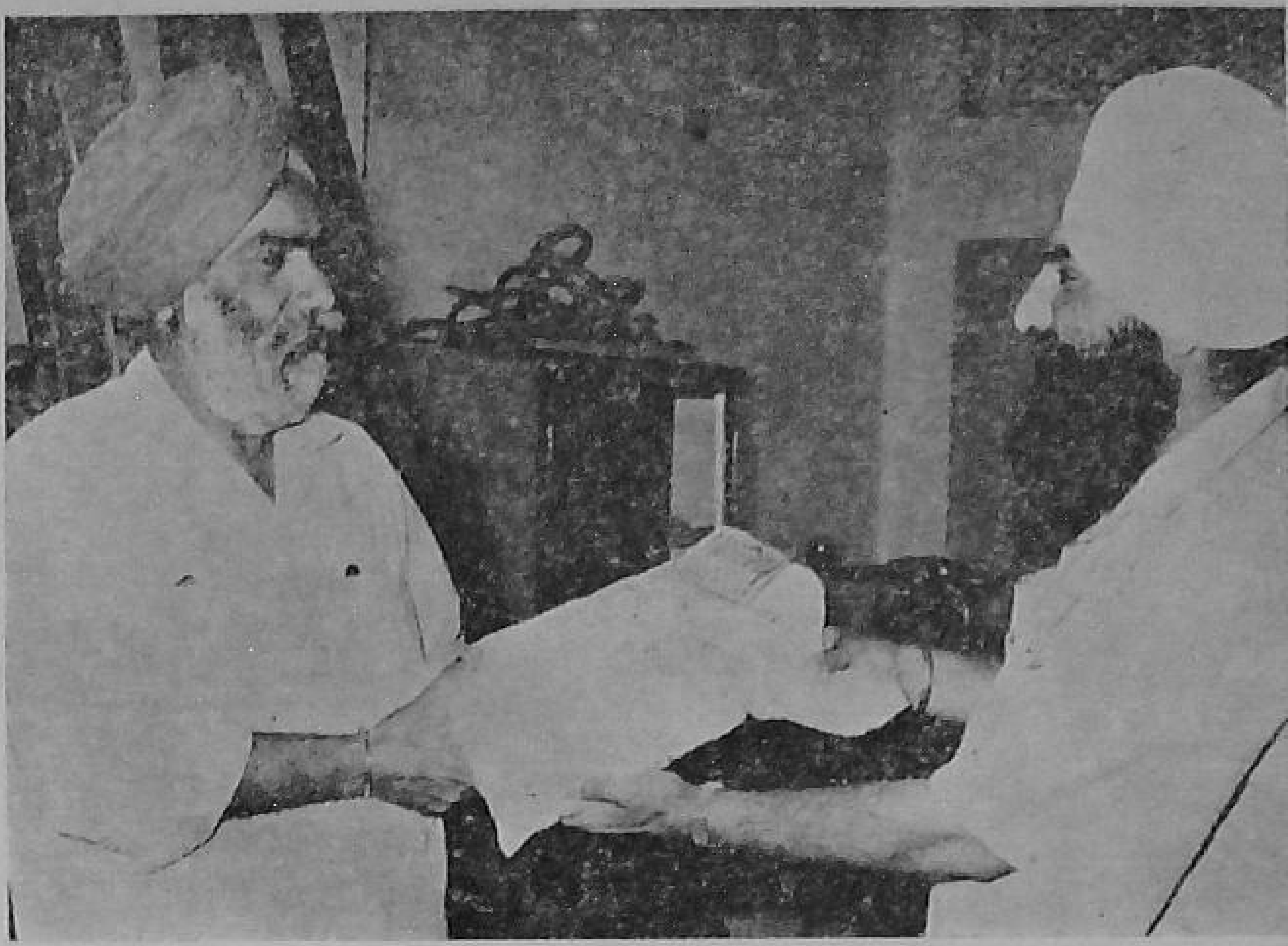
IMPROVED SEED SUPPLY

Larger quantities of improved seed were supplied to farmers during the year, as can be seen below.

Crops	*Quantities needed during 1961-62*	*Quantities actually consumed up to 31-3-62*
Wheat	16,000 mds.	10,710 mds.
Gram	500 mds.	612 mds.
Cotton (American)	6,400 mds.	4,500 mds.
Cotton (*Desi*)	200 mds.	45 mds.
Hybrid maize	500 mds.	100 mds.
Jantar	600 mds.	337 mds.

IMPROVED IMPLEMENTS

Rapid development of agriculture depends on the use of improved implements as much as on other factors like fertilizers, etc. Hence, their use has been given an important place in the Programme.



Improved seeds are supplied to farmers in plenty

Implements	*Number needed during 1961-62*	*Numbers received*	*Numbers distributed*
Furrow-turning ploughs	500	1,750	140
Iron ploughs (improved *desi*)	2,000	9,600	468
Triphalis	3,200	910	6
Single-row cotton drill	1,600	860	—
Bar harrow	800	150	—

During 1962-63 it is so planned that no farmer in the District will be without an iron plough, a furrow-turning plough and a *triphali*. A sum of Rs. 3 lakhs is being provided by the Department of Agriculture for the purchase of such implements from approved fabricators. The improved ploughs will be sold on a 25 per cent subsidy through Co-operative Sales Depots. A sum of Rs. 8 lakhs is being provided from the IADP funds and about Rs. 1 lakh from the State funds for the grant of taccavi loans to farmers for the purchase of power threshers. In all,

Fertilizer supply is assured within the bullock-cart-distance

Farmers get the credit as and when needed

14,415 improved implements, 90 tractors, 45 threshers and 360 pneumatic-tyre cart wheels are proposed to be supplied under this Programme.

SCIENTIFIC DEMONSTRATIONS

Demonstrations, particularly the composite ones, where all the recommended practices are tried out on one single crop, deserve special mention. During the year 1961-62, as many as 3,000 demonstrations were planned for the *kharif* and *rabi* seasons against which 1,387 were laid out during *kharif* and 1,255 during *rabi* (total: 2,642) as indicated below:

Kharif			*Rabi*		
Crop	*Number of demonstrations laid out*	*Percentage of increase in yields*	*Crop*	*Number of demonstrations laid out*	*Percentage of increase in yields*
Cotton	401	25	Wheat	1,049	Results not yet available
Groundnut	185	41.4	Gram	133	
Maize	410	32.1	Potatoes	69	
Paddy	19	24.9	Fodder	4	
Sugarcane	360	Results not yet available			
Vegetables (Potatoes)	10	51.8			
	1,387			1,255	

CREDIT

In the 201 villages selected for the Package work, there are 260 primary credit societies with a membership of 35,860. These societies disbursed credit to the extent of Rs. 10.20 lakhs (Rs. 3.37 lakhs as short term and Rs. 6.85 lakhs as medium term) on the basis of production plans during the year ending June 1962. In addition to cooperative credit, the Government advanced Rs. 34 lakhs during 1960-61 and Rs. 22.4 lakhs during 1961-62.

During 1962-63, it is estimated that farmers would need Rs. 135 lakhs as short-term credit and Rs. 34 lakhs as medium-term credit. This will be in addition to the medium-term loans from other sources for minor irrigation projects and purchase of tractors.

STORAGE GODOWNS

Ninety godowns would be the need of the District. Of these, 28 existed at the start of the Programme and 19 have since been constructed. Forty-three are under construction at present; 205 godowns have been taken on hire.

IMPLEMENTS WORKSHOP

The workshop attached to the Agricultural College is proposed to be strengthened under the Programme. The workshop will test and develop improved implements, undertake manufacture of prototypes, train the village artisans and farmers in the repair and use of implements, etc.

SOIL-TESTING LABORATORY

The soil-testing laboratory at Ludhiana is to be strengthened for testing a greater number of soil samples. During 1961-62, 2,216 soil samples and 84 water samples from Ludhiana District have been tested. When the existing laboratory is strengthened, it is expected that some 30,000 samples will be tested every year. A soil survey of 20,000 acres in the District has also been conducted.

QUALITY SEED PROGRAMME

Four seed-processing units have been set up in the Seed-testing Laboratory at the Agricultural College, Ludhiana. The laboratory will test some 3,600 seed samples in the current year. Fifty-four thousand maunds of wheat seed will be given solar treatment against smut. It is also proposed to enlist 900 farmers as Registered Seed Growers in the District.

Plans are to distribute 16,000 maunds of wheat seed, 5,000 maunds of cotton seed, 1,300 maunds of *desi* cotton seed, 110 maunds

Godowns have been built to store improved seed, fertilizers and other supplies

of hybrid maize seed and 135 maunds of groundnut seed this year. It is also proposed to produce 4,500 maunds of good quality wheat seed on Departmental farms in the District. The 135 Regisetred Seed Growers will also produce 30,000 maunds of good wheat seed during the current year.

BENCH-MARK SURVEY AND ASSESSMENT

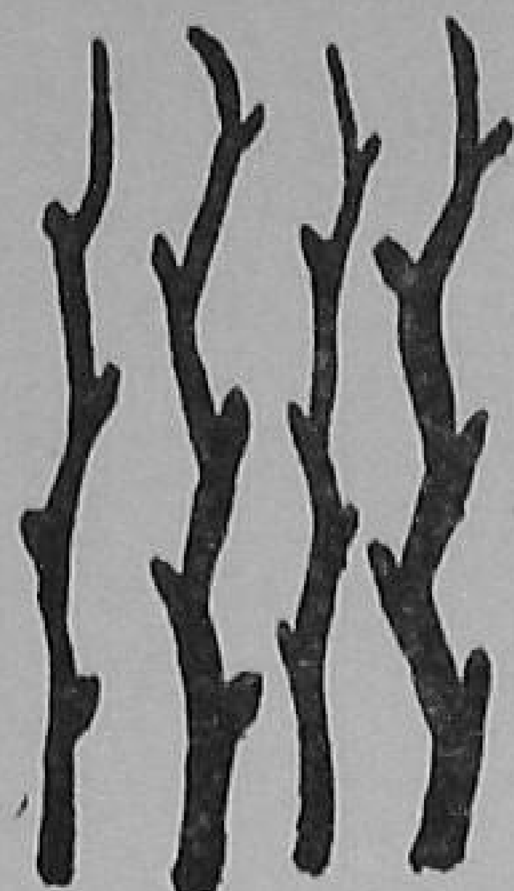
The work was started in December 1960 when resource data by random sampling was collected from 72 villages in the District. A second phase of bench-mark survey dealing with crop-cutting experiments was also carried out during *rabi* 1960-61 and on *kharif* crops in 1961. It is also proposed to carry out village case studies and the work in this connection has recently been started. It will be guided by a rural sociologist.

During the year 1962-63, crop-cutting experiments on all the important crops will be conducted in all the nine Blocks. There will be in all, 1,786 such experiments in the District, besides 324 experiments to be conducted in control areas outside the District. Some 864 agricultural families in 108 villages will be selected for study under bench-mark survey spread over 9 Blocks in the District, against 286 families in 36 villages in the central area of the 3 adjoining Blocks.

INFORMATION AND PUBLICITY

For 1962-63, a detailed information education programme has been drawn up. It includes staging of some 1,800 dramas and film shows, distribution of 1,44,000 posters and 72,000 folders. It is also proposed that the Intensive Agricultural District Programme staff should give radio talks, school talks and contribute features to local and central magazines. It is also proposed to print copies of a IADP Bulletin for the use of field staff and others. *Melas* and exhibitions will also be arranged.

By J. P. NAURIYAL

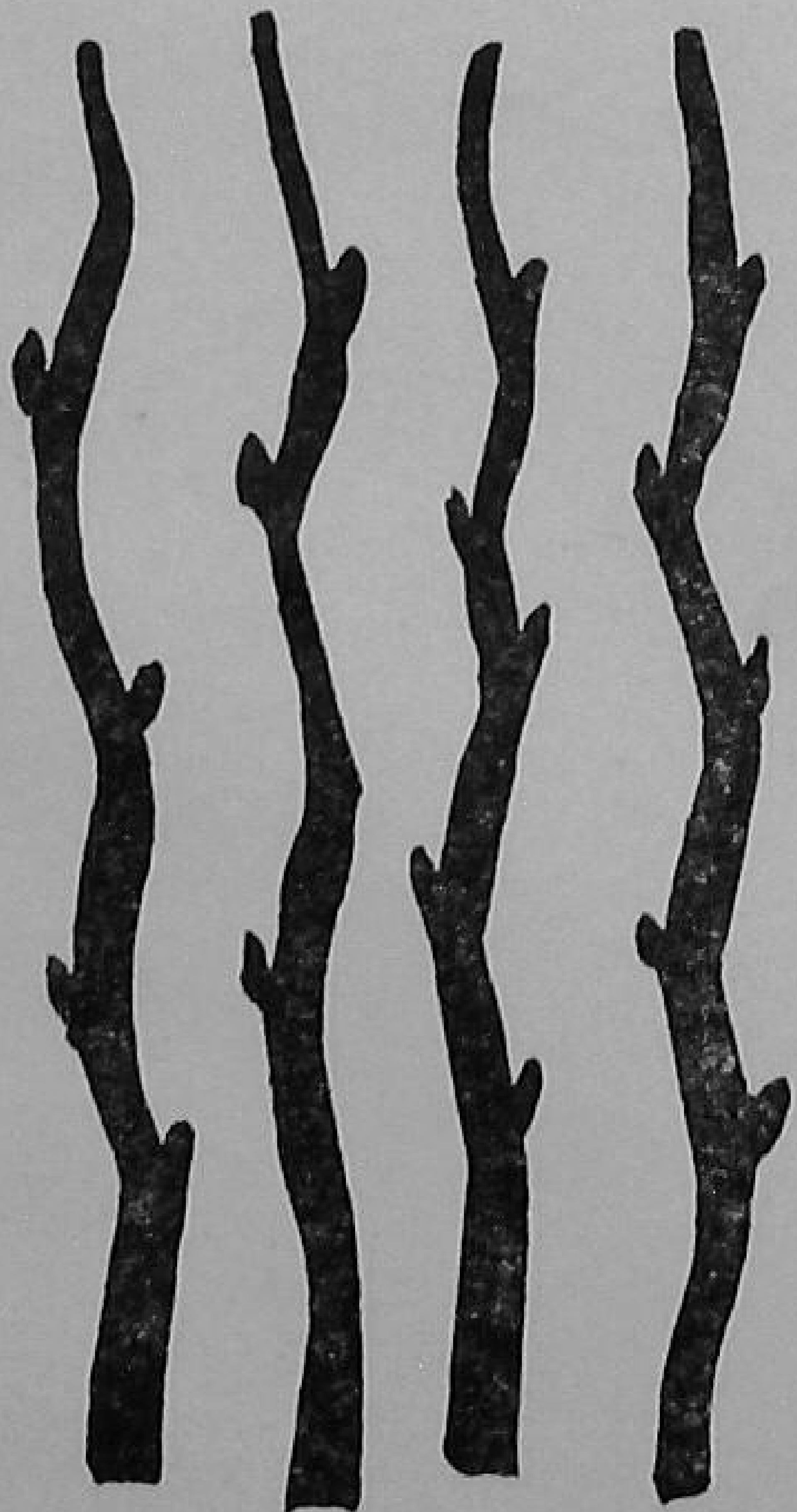


FOR the past few years, many apple-growers are planting their orchards with apple varieties belonging to the 'Delicious' group.

For getting fruits of good size and quality over a long time from these trees, they should train their apple trees properly.

A properly trained tree prevents over-crowding of branches and provides enough sun and shade to the fruits to develop well.

APPLE TREES need proper training



But the way you train the trees will depend largely on their growing habit.

1. The upright growth habit

Trees an upright with-growth habit should be trained in such a manner that the branches may spread out and make the trees more 'open.' To do this, make cuts just above the buds located on the outer sides of twigs and branches.

2. Tendency to form narrow-angled crotches

The Delicious type varieties like other apple varieties with an upright growth habit, have the tendency to form narrow-angled weak crotches. The formation of many such narrow-angled crotches gives the tree a weak structure. Hence, while training, take care to select wide-angled and well-spaced branches

which will subsequently form the permanent scaffolds of the tree.

Also remember that the natural auxins (growth-promoting substances) produced in the terminals of shoots help in the development of wider angles. Allow a few shoots to grow temporarily just above the permanent branches. However, do not allow such shoots to grow longer than six to eight inches ; pinch them back regularly.

3. Over-dominant lower branches

The lowermost branches of Delicious type varieties often grow so rapidly that within a couple of years, they may equal or even surpass the original trunk-girth. This results in the formation of a weak tree, having two or three main branches arising very near each other within a short vertical distance on the trunk. Good training requires that the main scaffold limbs should be well-spaced, on and around the trunk. Check the growth of lower branches by a light heading-back of the first scaffolds. It is better to select the properly-spaced permanent branches early.

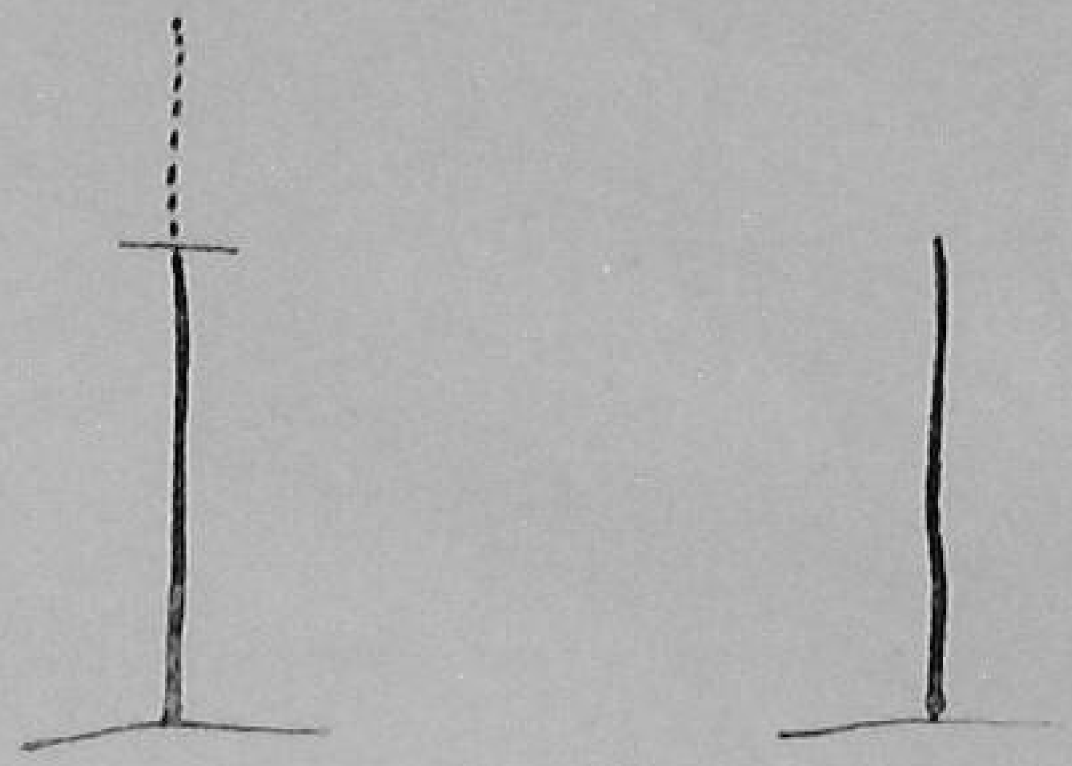
HOW TO TRAIN

Apple trees yield best when trained to the modified leader form. This is how you train apple trees into modified leaders.

1. At planting time—choose the head height and cut the whip accordingly

Decide upon the height of the head, that is, the distance from the ground at which the lowermost scaffold branches are to be kept on the tree trunk. In case of low-headed trees, this distance is usually 20 to 22 inches, whereas in high-headed trees the lowermost scaffold may be kept as high as 4 to 5 feet from the ground.

Lower-headed trees enable easy pruning, spraying and harvesting. But you will have to think of other things also. For example, if you are to raise a suitable intercrop, then high-headed trees are better. The recent



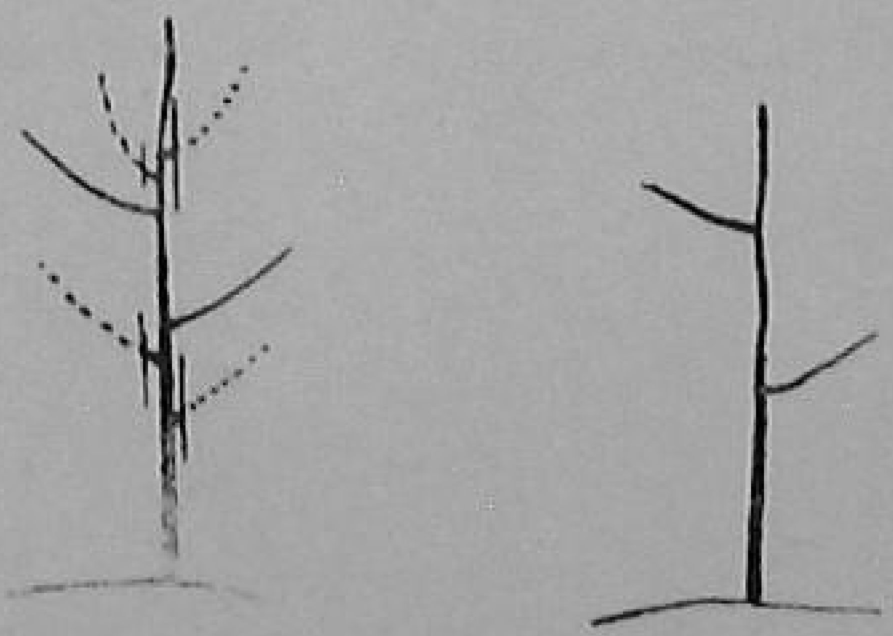
Before pruning After pruning

trend, however, is in favour of low-headed trees, even though the orchard may be inter-cropped.

To produce a low head, cut back the whip (one year old grafted plant) at a height of 2½ to 3 feet from the ground, at the planting time. This will induce branch formation in the lower parts of the trunk during next summer.

2. First summer—select the primary scaffold

Remove all branches which are lower than 20 to 22 inches from the ground. Select one



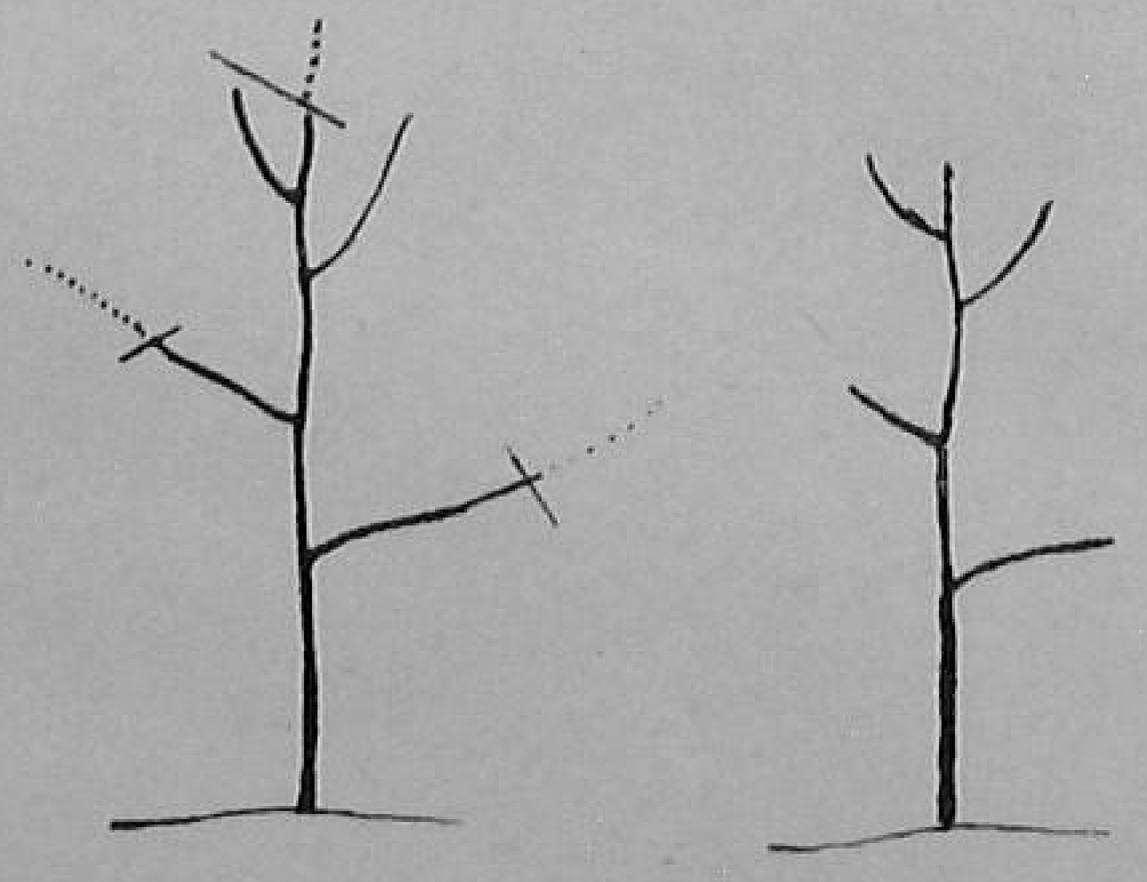
Before pruning After pruning

or two wide-angled (more than 60 degrees) branches for making the primary scaffolds. These should be spaced six to eight inches apart and preferably located in opposite directions. You may allow a few shoots to grow temporarily above the permanent branches to induce wide-angle formation between the main branches and the tree trunk.

For the same reason, leave the rapidly-growing shoots just below the cut made at planting time unpruned, till each one is six to eight inches long. Always keep the temporary growth small at the top as well as lower down the trunk by pinching off their rapidly-growing tips, otherwise the growth of permanent branches will become stunted. When the top shoots become six to eight inches long, remove all but one. The remaining shoots will form the modified leaders of the tree.

3. First dormant pruning

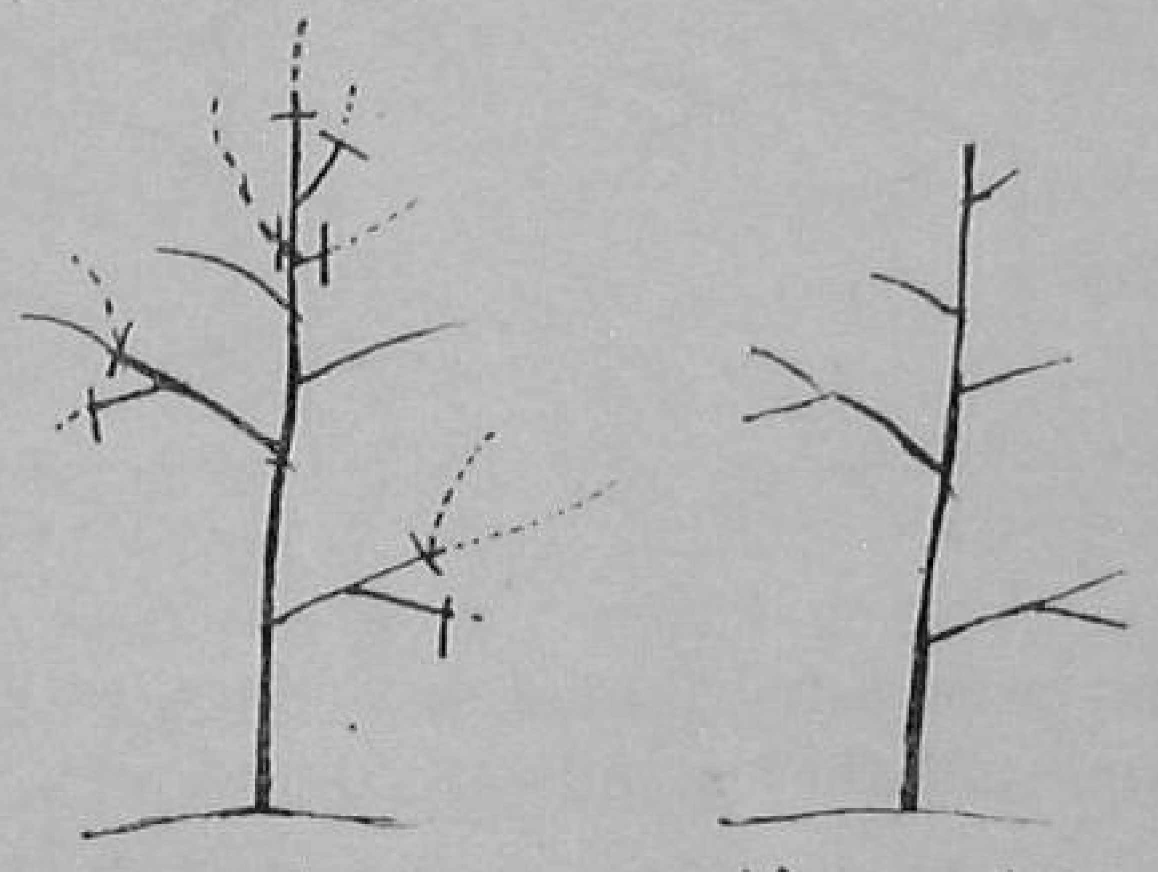
Prune the lowest permanent branch to 20 to 30 inches and all above that to 12 to 14 inches length, to check the overdominance of



the lower branches. Head the leader 10 to 12 inches above the highest branches. Temporary branches should be stubbed to five to six inches length.

4. Second summer pruning

Select two or three more scaffolds besides those already selected during the previous summer. Space them six to eight inches apart vertically on the trunk. Each scaffold should be at least 90 degrees around the trunk from the next one below it.



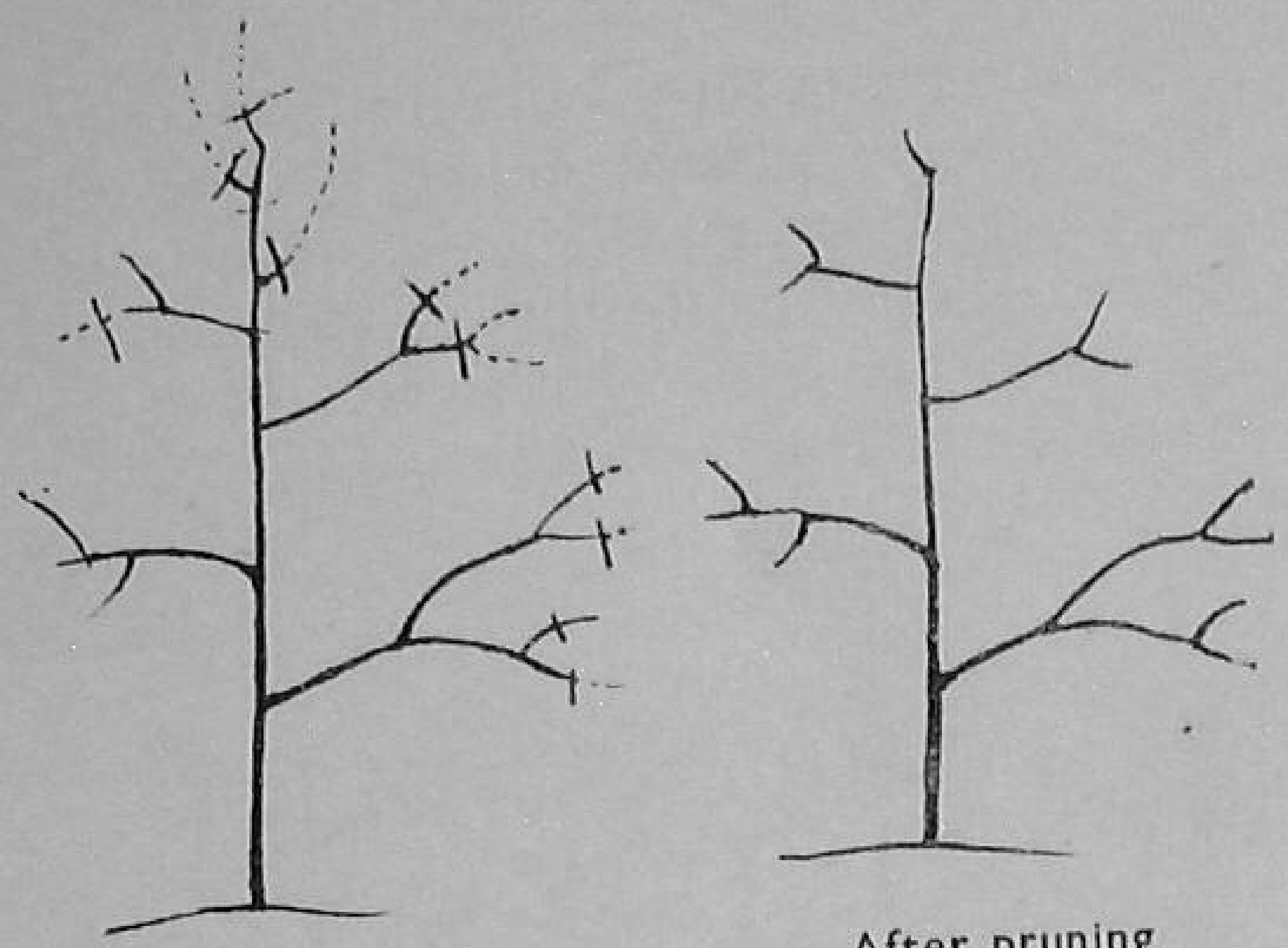
Thin out all the undesirable growth. The temporary growth should be cut back to stubs, five to six inches long in the case of one-year-old growth and 10 to 12 inches long in the case of two-year-old twigs. As the tree grows older, allow these stubs to grow longer, but not more than two feet long.

If the tree is growing vigorously, head back the secondary scaffold branches.

5. Second dormant pruning

By this time, the selection of primary scaffolds (four to six in number) should have already been completed. At the second dormant season, the secondary scaffold branches are to be chosen.

On each primary branch, select two secondary branches and remove all others. Now, the head of the tree will consist of eight



Before pruning

After pruning

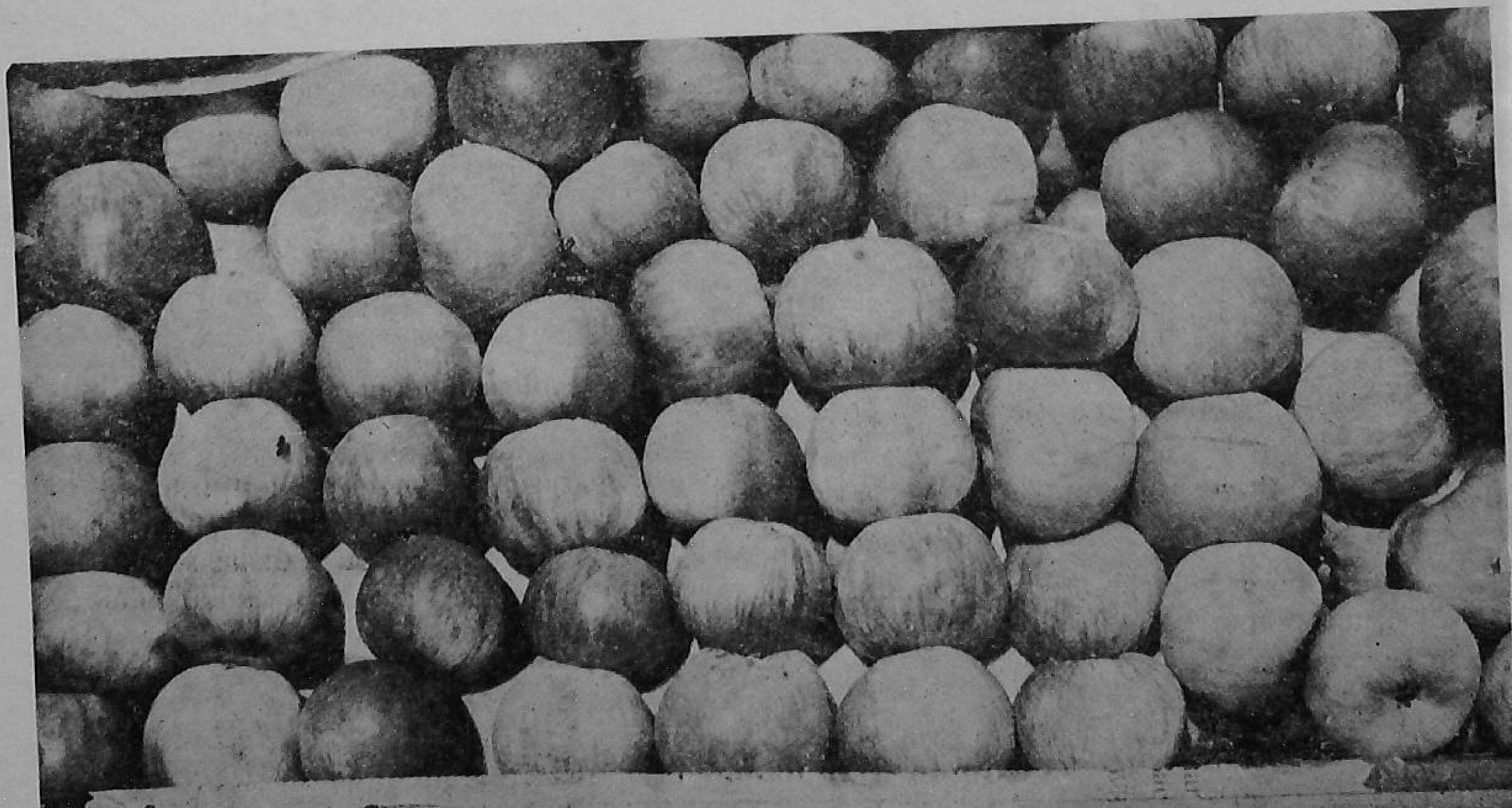
to ten evenly-distributed secondary scaffolds. Other superfluous, misplaced and interfering branches should be removed. You may, however, keep a few small branches which may develop from the primary scaffolds, for early fruiting wood.

6. Subsequent prunings

From now onwards, reduce pruning operations to the minimum; only thinning is required. Avoid summer pruning, otherwise it may dwarf the whole tree.

The scaffold system of the tree having been properly established by now, the leader is modified or suppressed by heading it above an outward lateral bud. This way you build up the basic framework of the tree. When this is done, you have no difficulty in the management of the trees, and they will give high yields of good quality fruits for many years.

To get apples like these, see that you pay good attention towards pruning of your apple trees



Shri Paliwal—winner of many crop competition awards

HOW HE MADE A WHEAT-ACRE YIELD 58 MAUNDS

By N. K. VERMA

FARMERS around Ingotha, Sadar Tahsil of Hamirpur District, Uttar Pradesh, when faced with any farming problem, seek Shri Laxmi Chand Paliwal's advice; because Paliwal has been winning awards in crop competitions year after year.

For three years in succession, his potato crop has been winning the first prize at the District level crop competitions. In 1959-60 he harvested over 477 maunds of potato from one acre.

Similarly, he has been winning prizes for his wheat crop from 1954-55 either at District or Zonal or State level. In 1960-61, he won the first prize at the District-level competition for harvesting 48 maunds and 6 seers of *jowar* from an acre.

In that year, he also saw his dream come true when he won the first prize of 5,000 rupees at the State-level wheat competition, by harvesting 58 maunds 22 seers and 4 chhataks of grains per acre from his wheat-plot.

"It is all due to the U.P. method of wheat cultivation," says Sri Paliwal, "I have found this method, with a few changes, best suited to our area."

This is how Sri Paliwal succeeded in getting 58 maunds 22 seers and 4 chhataks of wheat per acre.

The plot on which he raised this crop has light soil. It is irrigated by a pucca masonry well.

Sri Paliwal firmly believes that for good crop-yields, both organic and inorganic manures should be applied in proportionate doses.

In summer, Shri Paliwal applied 20 cartloads (about 200 maunds) of farmyard manure. Then he broadcast *dhaincha* seed at 15 seers per acre in the first week of July when the monsoon set in. In the second week of August, the *dhaincha* crop was turned in as green manure. The field was kept submerged under the water during September.

In the first week of October when the water was let out from the *bundhi* (bund), one maund of ammonium sulphate was broadcast on the moist, sticky field. Later on when the soil became friable, it was ploughed six times with a *desi* plough and a fine seed-bed was prepared.

Shri Paliwal always uses improved seed which he mixes with the farmyard manure before sowing.

On the 26th of October, *Pb. 591* variety of wheat seed was dibbled at 6 seers per acre. The first irrigation was given in the last week of December when the crop was also top-dressed with one maund of ammonium sulphate and weeded.

In the last week of January, the field was irrigated again. The last irrigation was given in the last week of February. The field was valued for the competition in the first week of April and then the crop was harvested and threshed.

One acre of wheat from this plot gave him a net profit of Rs 807.

This is the economics of his wheat cultivation :

	Cost per acre in rupees
Preparatory cultivation	
1. Ploughing six times	36
Seeds and sowing	
2. Cost of seed and dibbling	80
Manures and manuring	
3. Farmyard manure at 20 cartloads per acre and its application	50
4. Cost of *dhaincha* seed—broadcasting and covering the same	20
5. Cost of ammonium sulphate (2 maunds per acre)	32
After-cultivation	
6. Weeding and hoeing	12
7. Irrigations (three)	50
Harvesting, threshing, etc.	
8. Harvesting	20
9. Threshing and winnowing	35
10. Rent and other miscellaneous charges	15
Total expenditure	350

Yield of grain : 58 maunds 22 seers 4 chhataks
Yield of straw: 110 maunds

Sale price of grain at Rs. 16 per maund :	Rs. 937/-
Sale price of straw at Rs. 2 per maund :	Rs. 220/-
Total income	Rs. 1,157/-
Total expenditure	Rs. 350/-
Net income	Rs. 807/-

JAPANESE TECHNIQUES FOR INDIAN PADDY FARMS

IN the summer 1959, four Japanese farmers arrived in village Sorana near Saharanpur in Uttar Pradesh. These farmers, experienced in paddy cultivation in their own country, had arrived, at the specific request of the Government of India, to demonstrate the techniques of paddy farming to our farmers. They brought their own machinery, both manual and power-operated, like the single bullock ploughs, threshers, power tillers, pumps and powers sprayers. They took on lease a 3½-acre farm from a local farmer, and started working in the *kharif* of 1959. They carried out all the cultural operations themselves and depended least on hired labour.

Japan like India is a rice-growing country, but the Japanese follow a highly developed system of paddy cultivation so evolved as to suit the small farms, which farmers there usually possess.

The four Japanese farmers, Tanaka, Miyaishi, Nishizaka and Kano, had come to show how the techniques they follow back home for raising paddy could also be used in our small farm units here.

Working for four agricultural seasons, till the *kharif* of 1961, the Japanese farmers produced impressive results. In 1960, they could raise paddy yield from the normal of 15 maunds per acre in the area to 52 maunds for the first crop and 72 maunds for the second crop. They also raised a wheat crop in the same field, which yielded 24½ maunds of grain per acre.

The techniques the Japanese farmers had used to get such good yields, it was seen, consisted of three important factors. The first, they followed the practice of balanced fertilization of the crop with organic and inorganic manures. The second, they gave great importance to water management, drainage of the fields receiving as much care as did irrigation. The third was mechanization of cultivation which helped them carry out all cultural operations quickly and in proper time, according to schedule. Any delay in field operations, as our farmers also know, results in lower rice yields.

The implements the Japanese farmers used attracted the attention of the neighbouring farmers. These were particularly easy to handle and work in small plots of even up to one eighth of an acre. The single bullock plough they used aroused a lot of interest. This plough, worked by one bullock, can do as much work as is done by a pair of bullocks.

Encouraged by the results of this experiment, it was felt that such demonstrations should also be extended to other paddy

The Japanese introduced this single-bullock plough at their Saharanpur farm which attracted particular attention from the neighbouring farmers

The Japanese have special implements for intercultural operation. The picture shows two of such implements in action

areas. In April this year, the Government of India entered into an agreement with the Government of Japan for organizing demonstration farms in various parts of the country. Four such farms, at Chakuli in Sambalpur District, Orissa, Ranaghat in Nadia District, West Bengal, Arrah in Shahabad District, Bihar, and Vyara in Surat District, Gujarat, were taken up as locations for the demonstrations.

The results of the Japanese method of paddy cultivation were impressive. This Japanese farmer from Saharanpur farm is seen with a bumper crop of paddy

The equipment and the technical know-how at these farms have been provided by the Japanese Government. Each Centre has a team of Japanese experts, consisting of a Project leader and three other members. The Project leader is a qualified technician with considerable experience of farming and extension. He is assisted by one Agricultural Engineer and one Agronomist. The fourth member of the team is a farmer with some experience of Indian conditions.

These teams are now working at these locations, and their mode of working and the equipment they use are being keenly observed by farmers in the neighbourhood. The rice crops they are raising now show good promise of turning out to be heavy yielders.

The Japanese method of paddy cultivation introduced into India a few years ago helped raise our rice production to a certain extent. The demonstration farms now being run by the Japanese experts will be another step forward towards better rice growing in our country.

MASTITIS

EARLY PRECAUTIONS NECESSARY

INFLAMED udder and the "blind" teats are symptoms of mastitis, a very serious and infectious disease affecting milch animals. Affected animals yield less milk, and that too of poor quality and dangerous for human consumption.

A study on mastitis in Maharashtra State has shown that by observing strict hygiene and effective curative measures, mastitis can be controlled. It was seen that Pencillin in doses of 50,000 to 100,000 International Units repeated daily for three to four days gives good results in the early stages of infection.

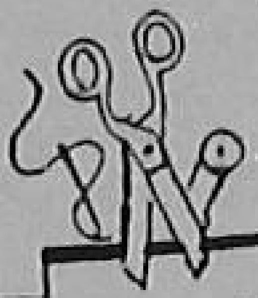
Early detection and great care are advised to keep the loss of cattle low, as the advanced cases of mastitis are difficult to cure. It is recommended that such affected animals should be disposed of in the interest of other healthy animals.

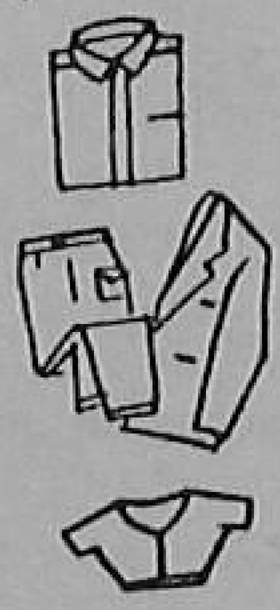
DEAL *Only* IN

METRIC LENGTHS

With the compulsory use of metric linear measure throughout the country from 1st October, 1962, transactions are now in terms of the metre.

Here are some equivalents of standard garment lengths. Familiarity with the new unit will help you to give up thinking in terms of yards.





SHIRT	:	2 metres and 75 centimetres (2.75 metres) instead of 3 yards	
COAT	:	2.75 metres	instead of 3 yards each
TROUSERS	:	2.75 metres	
BLOUSE	:	0.90 metre	instead of 1 yard

A Sari of 6 yds. will be 5½ metres in length.

1 Metre = 1 yd. and 3⅜ inches
If a yard of cloth cost Re. 1.00 nP., a metre of the same cloth will cost Re. 1.09 nP.

METRIC SYSTEM Means

SIMPLICITY & UNIFORMITY

ISSUED BY GOVERNMENT OF INDIA

DA 62/432

SPECIAL FARM FEATURE

A POTATO KING OF JULLUNDER

Sardar Iqbal Singh inspecting his extensive potato field

By M. L. N. IYENGAR

"MEET Sardar Iqbal Singh Dhillon of Khurla-Kangra, a potato king of the area"—this is how I was introduced by the local Agricultural Officer to a healthy, prosperous looking Sikh gentleman of medium height.

Iqbal Singh, a man of great self-confidence, has built up a potato farm of 60 acres almost from scratch in the vicinity of Jullundur City. He raises two crops a year and his average yield ranges from 300 to 350 maunds per acre as against the usual 200 maunds in the region. He has his own irrigation arrangements and has built a cold store.

SELF-MADE MAN

He did not inherit his potato kingdom. He built it up acre by acre, tuber by tuber. Luck played no part in it. On the contrary, the partition ofthe country left him almost a destitute 15 years ago. He lost his fertile 125-acre farm in the canal colony of West Pakistan and came to India as a refugee. He was allotted I4 acres of land in the Garden Colony near Jullundur City.

Iqbal Singh toyed with the idea of growing potatoes after having failed to raise either a citrus garden (that was one of the conditions of land allotment), or sugarcane and *Colocasia* crops due to unfavourable soil and climatic conditions.

A man of action, he immediately planned to put his idea of potato cultivation into practice. He first thought of having a reliable source of irrigation and sunk a tube-well which proved successful. Encouraged, he straightaway planted nine acres under 'Darjeeling Red Round' potato, a variety that was commonly grown roundabout the area. The crop gave him an encouraging profit, and that laid the foundation of his present well-paying potato farm.

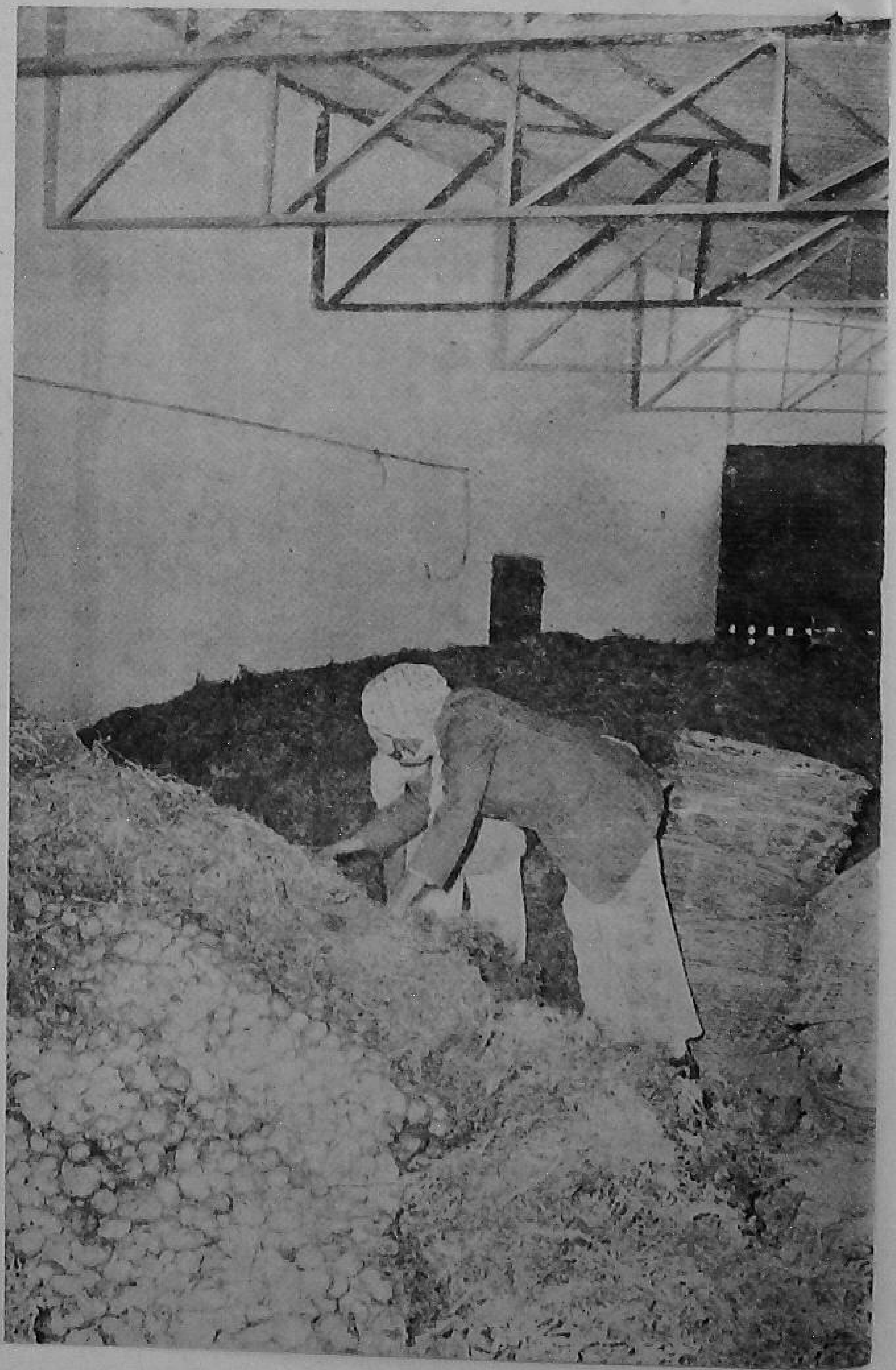
USES A BETTER VARIETY

During the past four years he has been raising two crops of potatoes on 60 acres between the months of September and May. He now grows 'Up-to-date', an early variety. He found that with 'Darjeeling Red', which is a late variety, it was difficult to raise a second crop. Moreover, 'Up-to-date' gives more marketable tubers, requires less fertilization and yields better.

GOES IN FOR ENOUGH MANURES

His quota of town compost from the Jullundur Municipality is sufficient just for 24 acres. So he applies four truckloads on an acre every fourth year. To supply enough plant food to the crop, he applies 4 cwt. of ammonium sulphate, 4 cwt. of superphosphate and 1 cwt. of potassium sulphate for the winter crop. He has found that with adequate potassium in the soil the skin of the tubers becomes stronger, the size bigger and the plants more healthy and disease-resistant.

The cold storage built by Sardar Iqbal Singh



ATTENDS TO PLANT PROTECTION MEASURES

Iqbal Singh, a practical man, takes no risk with pests and diseases, and follows a definite schedule of spraying—one spraying of 'Endrin' during winter, and three sprayings each of Bordeaux mixture and 'Endrin' to a secure a pest-free crop in spring.

RAISES HIS OWN SEED

He raises his own seed according to the technique of raising a disease-free potato seed evolved and perfected by the Central Potato Research Institute, Simla. Potato yields are very badly affected by virus diseases which are spread by plant lice or aphids. These aphids are either very inactive or almost absent from April to December. By raising a seed crop during these months, the growers can get their own disease-free seed, and thus save about Rs. 400 per acre which they normally spend on imported hill seed.

ADOPTS LATEST TECHNIQUES

Another technique that the experts have evolved and Iqbal Singh uses is breaking the dormancy of freshly-harvested tubers and making them sprout quickly by dipping them in a chemical solution like thiourea. This enables him to use the tubers lifted in November-December as seed for the spring crop in January-February. In other words, such treatment of tubers has helped him raise two crops in quick succession.

TAKES TO MECHANIZATION

Iqbal Singh is thinking of cutting down his cost of production further by mechanizing some of the pre-planting operations, as are being tried at the Experimental Station, Jullundur. Having a basic background of agriculture (he studied agriculture at the Lyallpur Agriculture College), he is always alive to new ideas and techiques available from the Research Stations and is very enthusiastic to put them into practice on his farm.

His self-confidence and receptivity to new ideas has put him in the vanguard of the agricultural revolution that has hit rural Punjab.

'CHOCOLATE TREE'

GROWS WELL IN THE SOUTH

Experiments so far conducted go to show that cacao, which gives us chocolate, can be grown with advantage in Kerala, Mysore and Madras.

Cacoa requires sufficient shade, well-distributed rains during both the monsoons and a well-drained soil. Cacao should not be planted on lands sloping southwards with severe exposure to the afternoon sun, as it effects the plants adversely.

Two hundred cacao seedlings should be transplanted in an acre. On an average, the cost of cultivation comes to about Rs. 125 per acre per year.

The plant starts bearing from sixth year onwards, and yields 5 to 10 pounds of pods.

Interested farmers can get their cacao seedlings from the Agricultural Research Station, Taliparamba in Kerala State, or the Kallar and Burliar Fruit Research Stations in Madras State.

By KANTHIMATHI KUMAR

Fig. 1

A FROCK with a three-piece SKIRT from an OLD SAREE

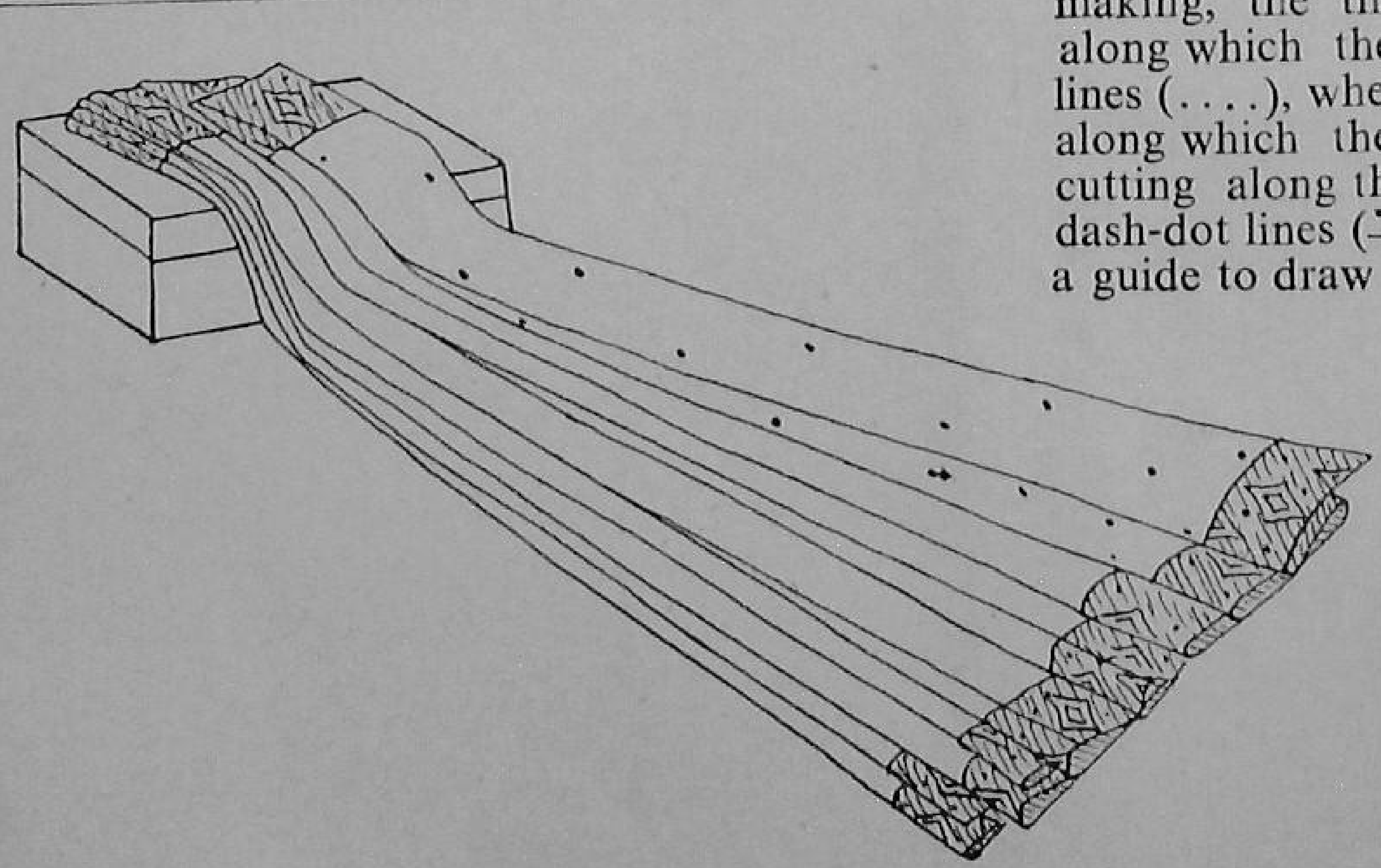


Fig. 2

A plain old saree with a printed border is ideal for making this frock with a three-piece skirt. The saree taken as an example is plain and white, 6 yards long and 44 inches wide, with a printed border $4\frac{1}{2}$ inches wide and a nice *palav*.

MEASUREMENTS OF THE FROCK

Length 19″. Waist-length 9″. Chest 22″. Waist 20″. Shoulder-width 9″. Sleeve-length $5\frac{1}{2}$″. Sleeve-band 9″.

I. How to make the pattern-pieces of the frock.

(*i*) *General instructions for following the diagrams.*

(*a*) In the diagrams, the different measurements are given within arrows, the arrowheads showing the exact limits of the measurements. Wherever space does not permit, the measurements are given without the arrows or with the arrows pointing to the measured length. A few measurements are explained with reference to the alphabets in the diagram and are given below the diagrams.

(*b*) In the diagrams, the thin lines (_) denote the edges of the paper taken for pattern-making, the thick lines (_) denote the line along which the pattern is cut. The dotted lines (. . . .), wherever shown, denote the lines along which the pattern is cut after the first cutting along the thick lines is done. The dash-dot lines (-.-) denote the lines used as a guide to draw the curves etc.

(*c*) In the diagrams containing the word 'fold', the rectangle consisting of the pattern represents the folded paper taken for pattern-making. Therefore, while taking the papers for drafting the pattern, take double the width indicated in the diagram in order to allow for the fold.

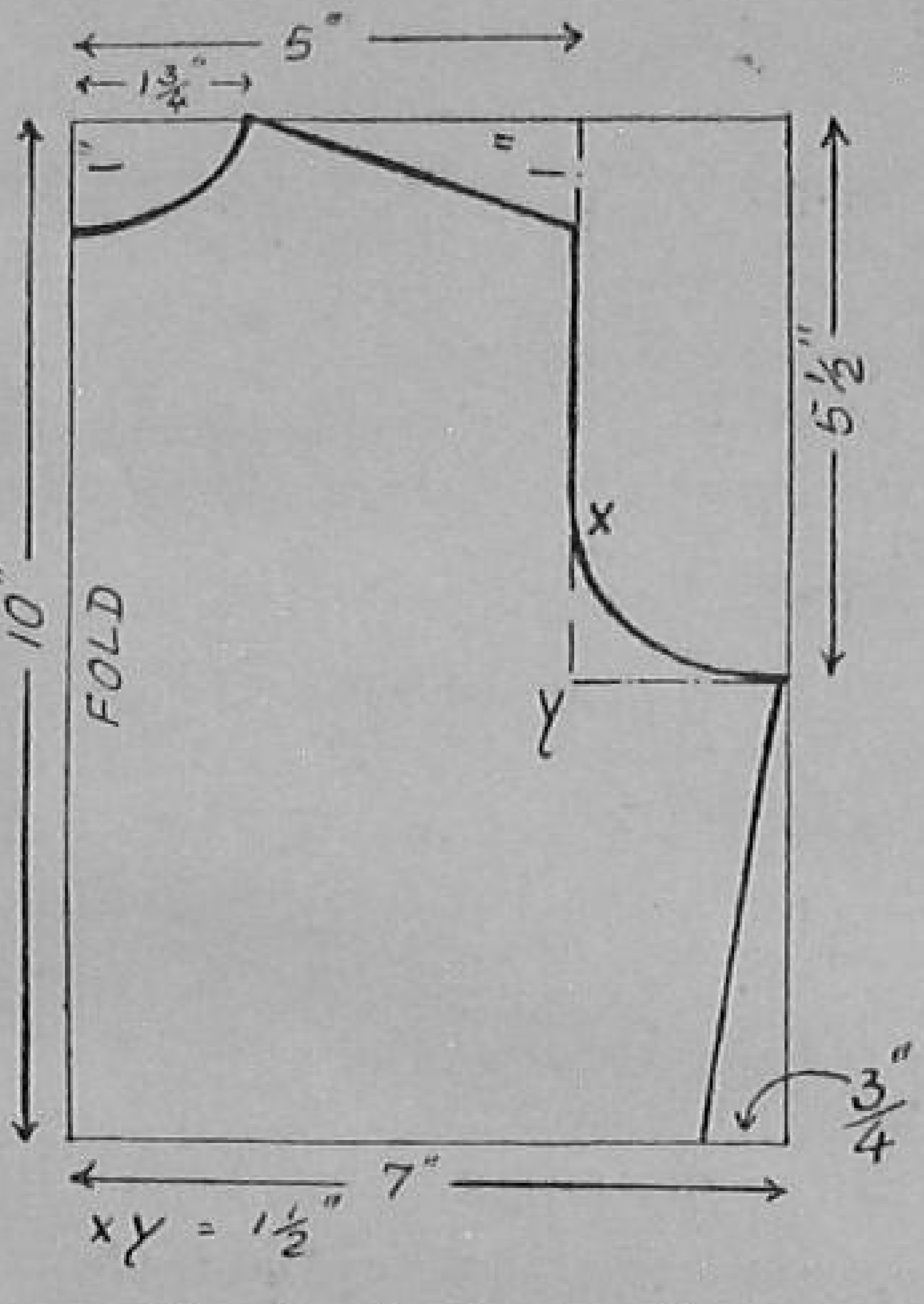


Fig. 3. Back of bodice

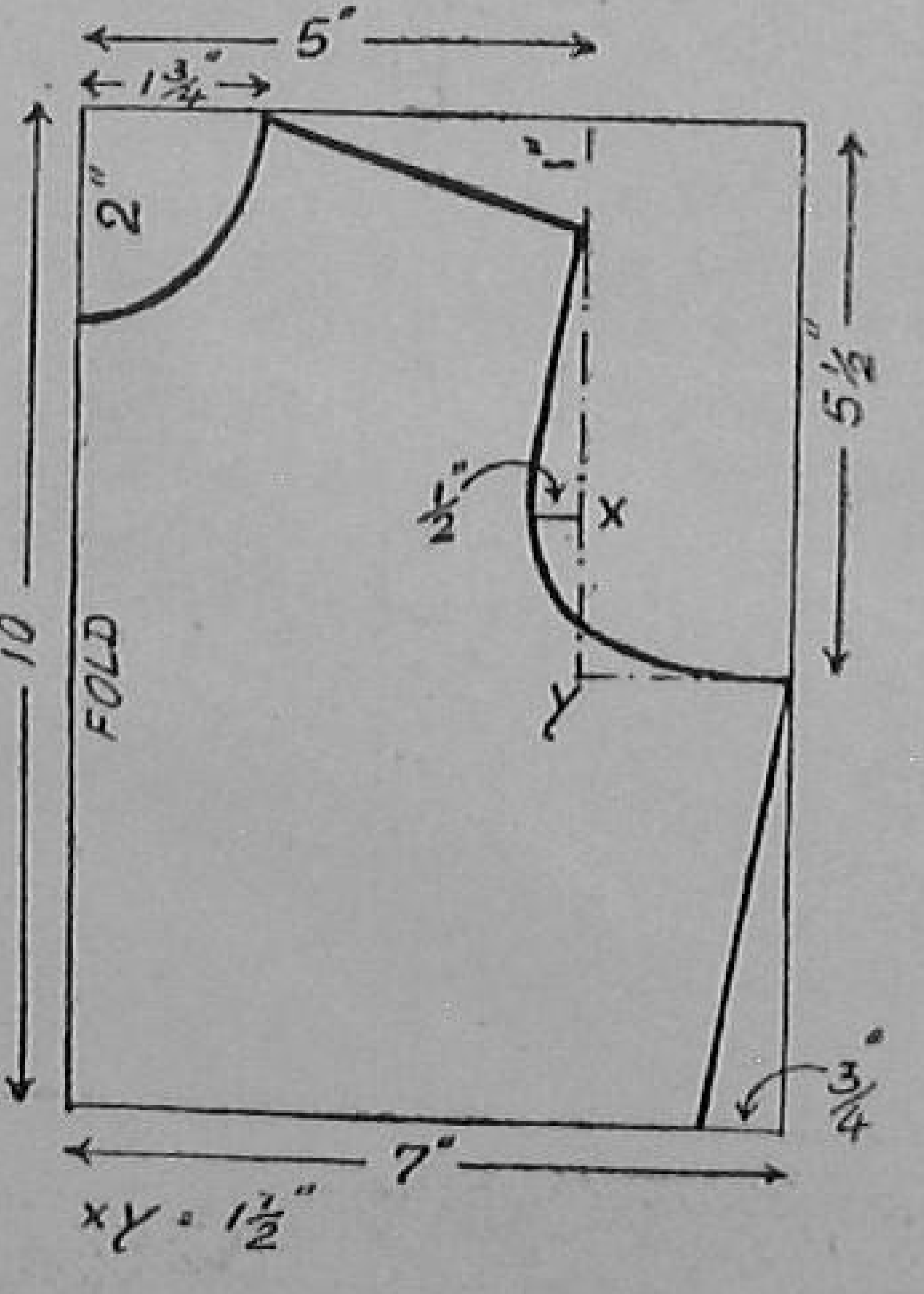


Fig. 4. Front of the bodice

(*d*) Mark the different points, showing the limits of the measurements on the paper taken for pattern-making, and draft the pattern as you proceed from point to point.

(ii) Particular instructions for making the pattern-pieces of the frock

(a) *The back and the front of the bodice. (Follow Fig. 3 and Fig. 4):* Draft the patterns of the back and the front of the bodice and cut along the thick lines. Along the central fold of the front bodice, cut a slit 3″ long from the neck downwards to form the front-opening.

(b) *Sleeves (Fig. 5):* Draft the sleeves and cut along the thick lines first. Open out the fold and cut along the dotted curve on

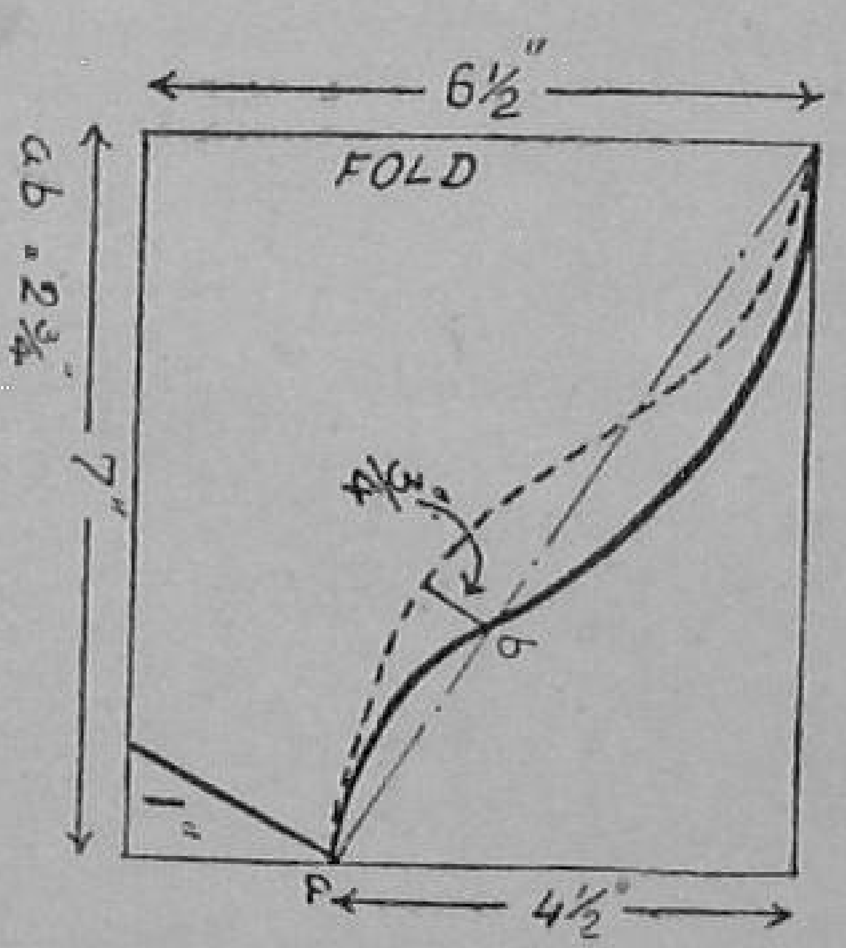


Fig. 5. Construction of sleeves

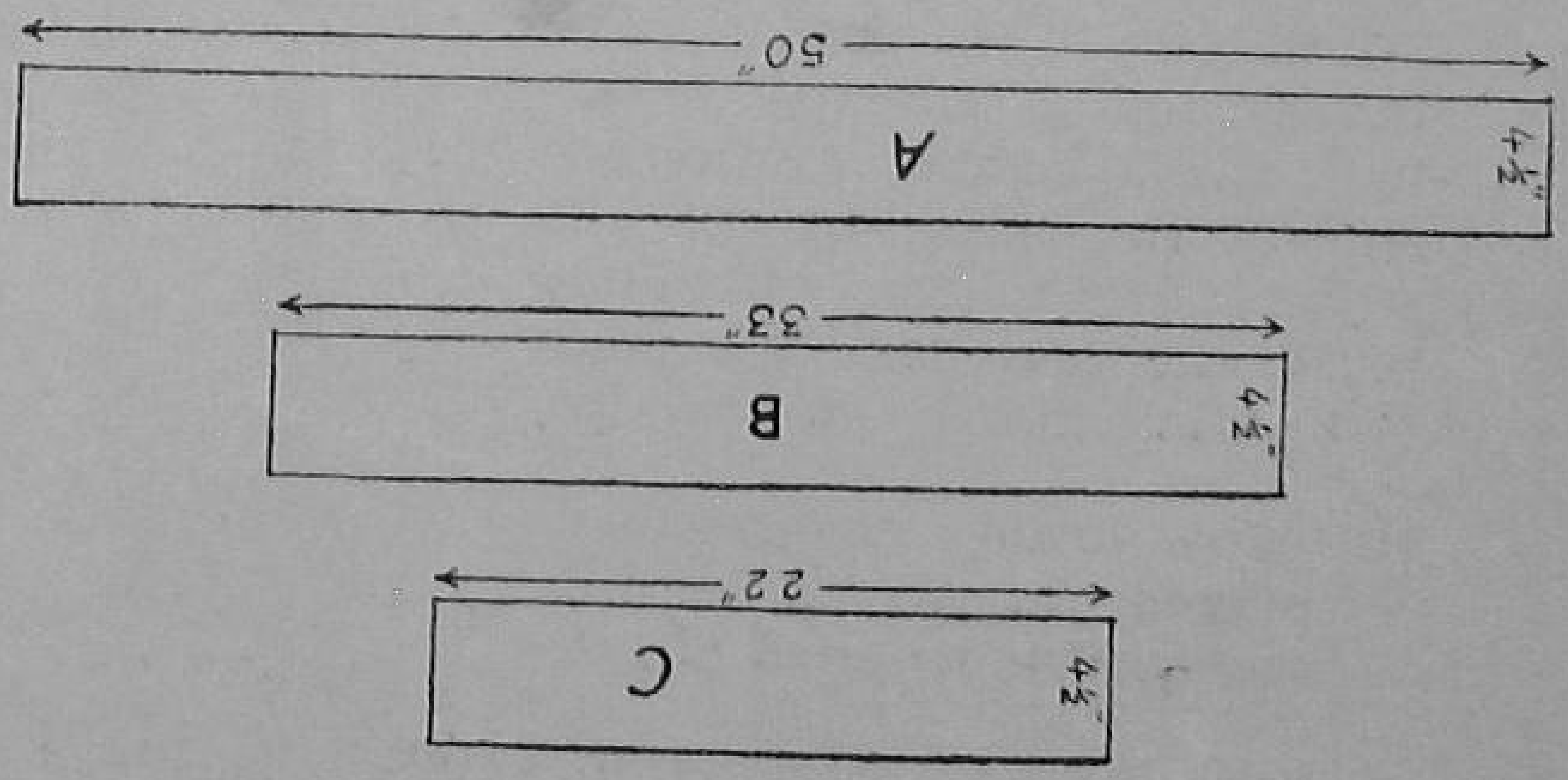


Fig. 6. Construction of the three-piece skirt

one half of the sleeves only. Prepare two sleeves. The portion cut deeper in the sleeve-head is to be attached to the front of the bodice. Therefore, note that the right sleeve is to be differentiated from the left sleeve.

(c) *Skirt (Fig. 6)*: The skirt is made of the three pieces A, B and C. 'A' is the lower-most piece, 'B' is the middle piece and 'C' is the topmost piece. Draft the patterns of A, B and C and cut two pieces in each of A, B and C for the front and the back of the skirt.

Shorten the width of each of the three pieces A, B and C of the back skirt by cutting off 2", and mark them as A′, B′ and C′ respectively. As the waist-line of the back bodice will be less than that of the front bodice when made, the width of the skirt for the back is to be less.

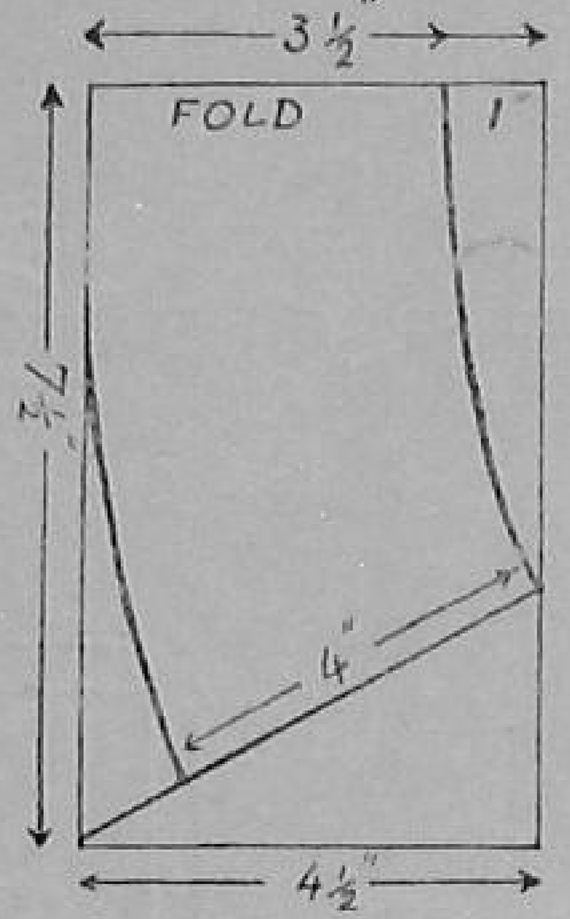


Fig. 7. The collar

(d) *Collar: (Fig. 7)*: Draft the collar and cut along the thick lines. Prepare two collars, of which one will form the lining.

(e) *Sleeve-bands*: For the sleeve-bands, cut two strips of paper 10" long and 2" wide.

II. Preparing the saree for the layout of the pattern-pieces (Fig. 8)

Iron the saree properly and cut off one of the borders. The border that is cut will be 4½" wide and 216" long. From one end of the saree, cut off the *pallav*. From the remaining part of the saree, cut off a piece of the plain fabric, 15" in width.

III How to lay the pattern-pieces on the saree-bits and cut the pattern (Fig. 9)

Pin the pattern-pieces of the front and the back of the bodice, the sleeves, the sleeve-bands and the collar to the 15" wide bit, cut from the saree, and cut the pattern-pieces. Note that the collar is cut from the border. Pin the pattern-pieces of the front and the back of the skirt viz. A, B, C, A′, B′ and C′ to the long piece of the border, cut from the saree, and prepare the skirt-pieces.

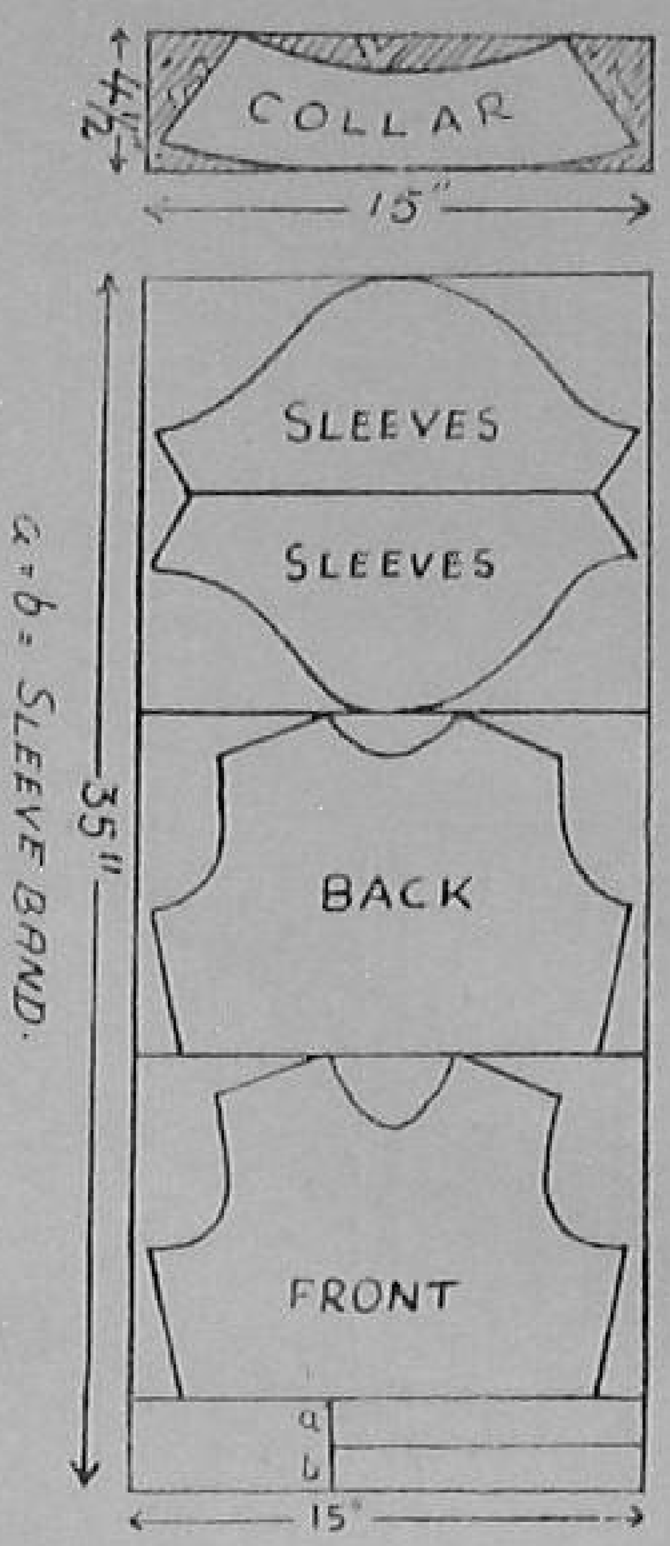
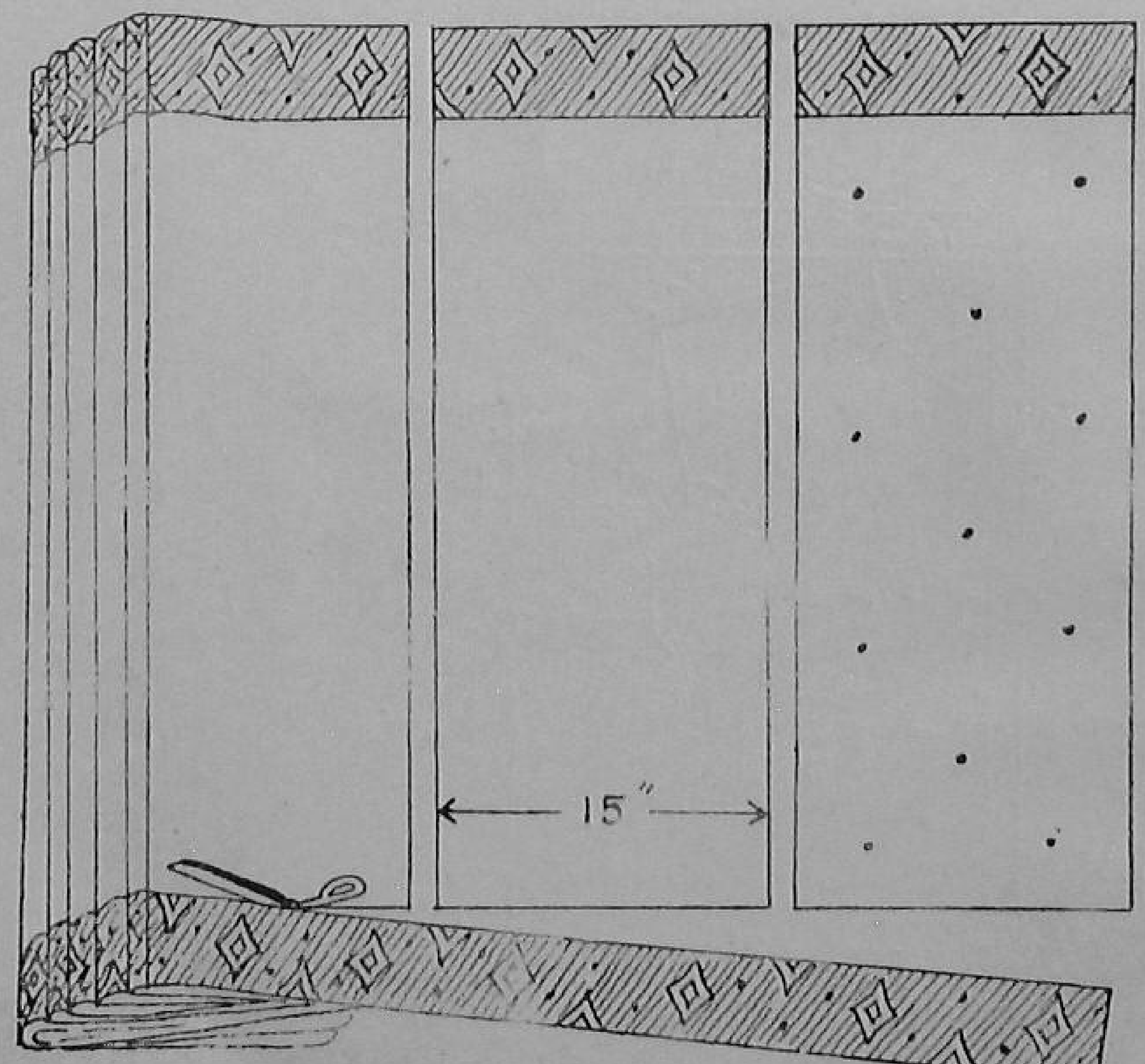


Fig. 8. Layout of the pattern pieces

HOW TO MAKE THE FROCK

Make the shoulder seams and the side seams of the bodice, leaving 3" free above the waist-line at the left side-seam of the bodice to form the side-opening. Make two darts, each ½" wide, at the back to fit the waist. Bind the slit at the front below the

Fig. 9. The saree made ready for the layout



neck with a narrow strip of the plain fabric of the saree (See Fig. 10). Attach a narrow folded piece of material just below the left side-binding of the slit to form the button-band.

Keeping the slevedge of the border as the lower end of each piece, gather the top of 'A' and join it to the lower end of 'B'; gather the top of 'B' and join it to the lower end of 'C'

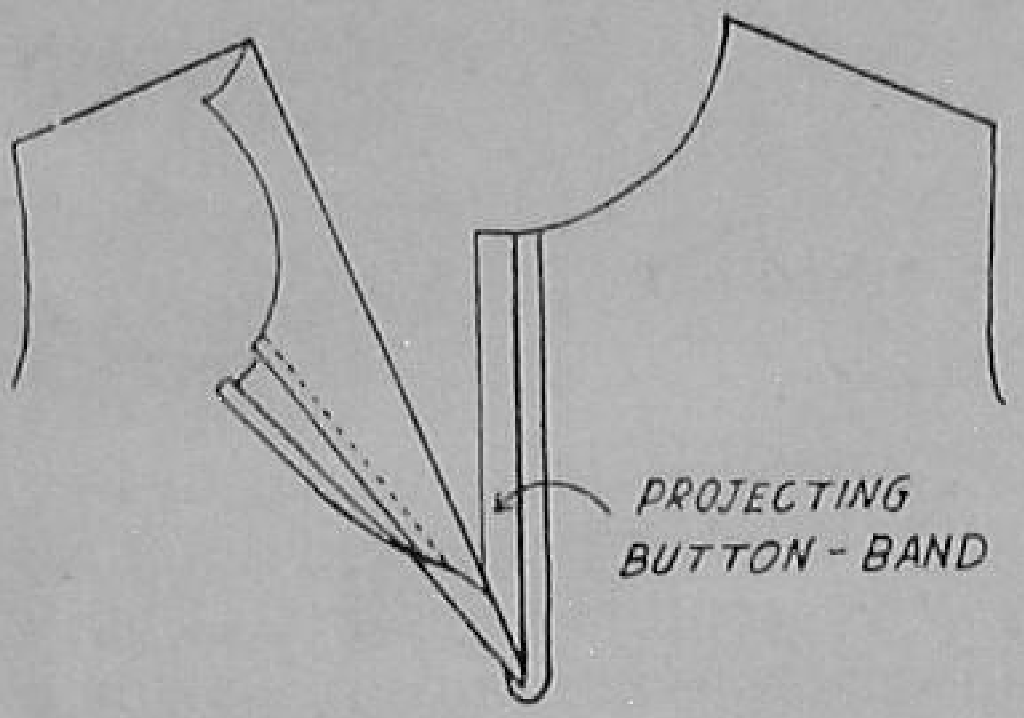


Fig. 10. Binding the slit at the front with a strip fabric

and gather the top of 'C' to fit the waist-line of the front bodice. (See Fig. 11). Prepare the back skirt in the same way with the three pieces A′, B′ and C′. Leaving 2½″ free from the left-side top C C′ to form the continuation of the side-opening of the bodice, make the side-seams of the front and the back skirts. Take care that the seams of A A′, B B′ and C C′ match.

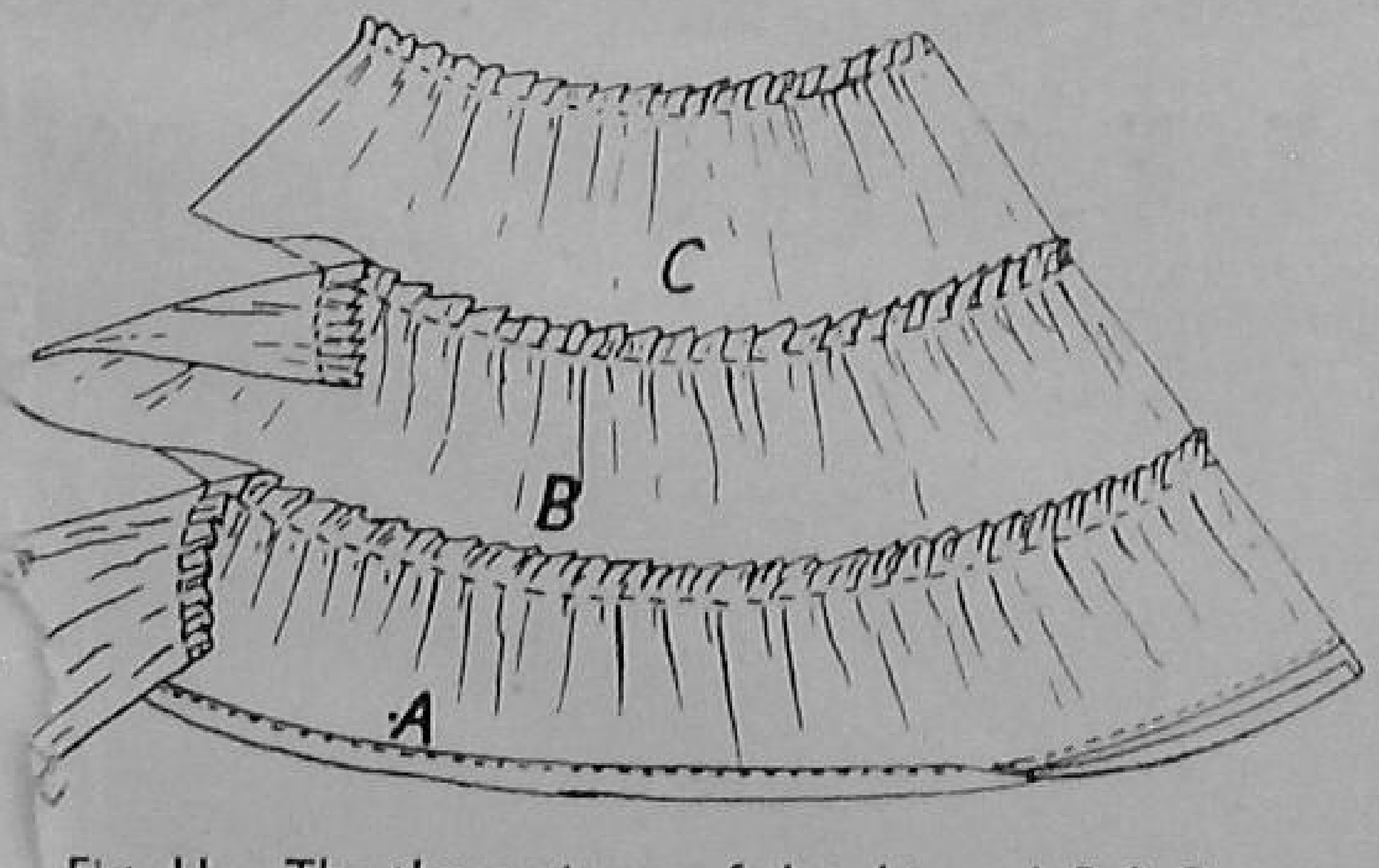


Fig. 11. The three pieces of the skirt—A, B & C

Make a narrow false hem at the lower end of the skirt. Attach the skirt to the bodice of the frock, so that the side-seams match and the raw edges of the side-opening of the bodice and the skirt are in line. Face the raw edge of the side-opening of the front and make a protruding band at the raw edge of the side-opening at the back (See Fig. 12). Place the facing over the band and secure them in position at the top and the bottom with a few invisible stitches. Sew the necessary buttons or hooks, keeping the waist-line intact.

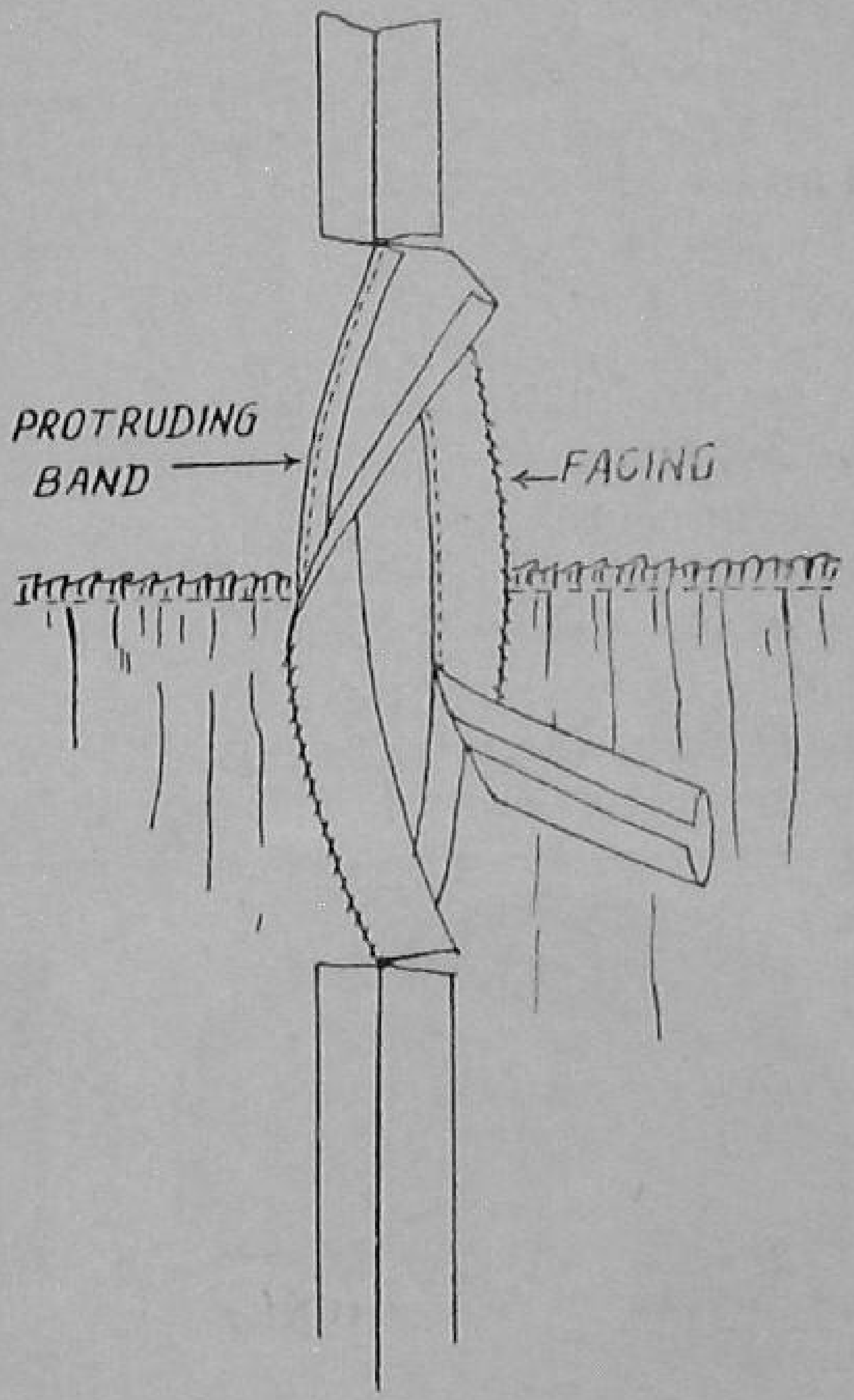


Fig. 12. Finishing the side opening

Gather the lower end of the sleeves to fit the sleeve-band and bind the sleeves. Leaving 2″ free from either end, gather the sleeve-head to fit the armhole. Make the side-seams of the sleeves and set the sleeves in the respective armholes, taking care that the portion cut deeper in the sleeve-head comes to the front of the bodice.

Place the two collars one over the other and join them along the outer edge, allowing ½″ for the seam. Turn the collar inside out and pin it to the neck of the frock, so that the

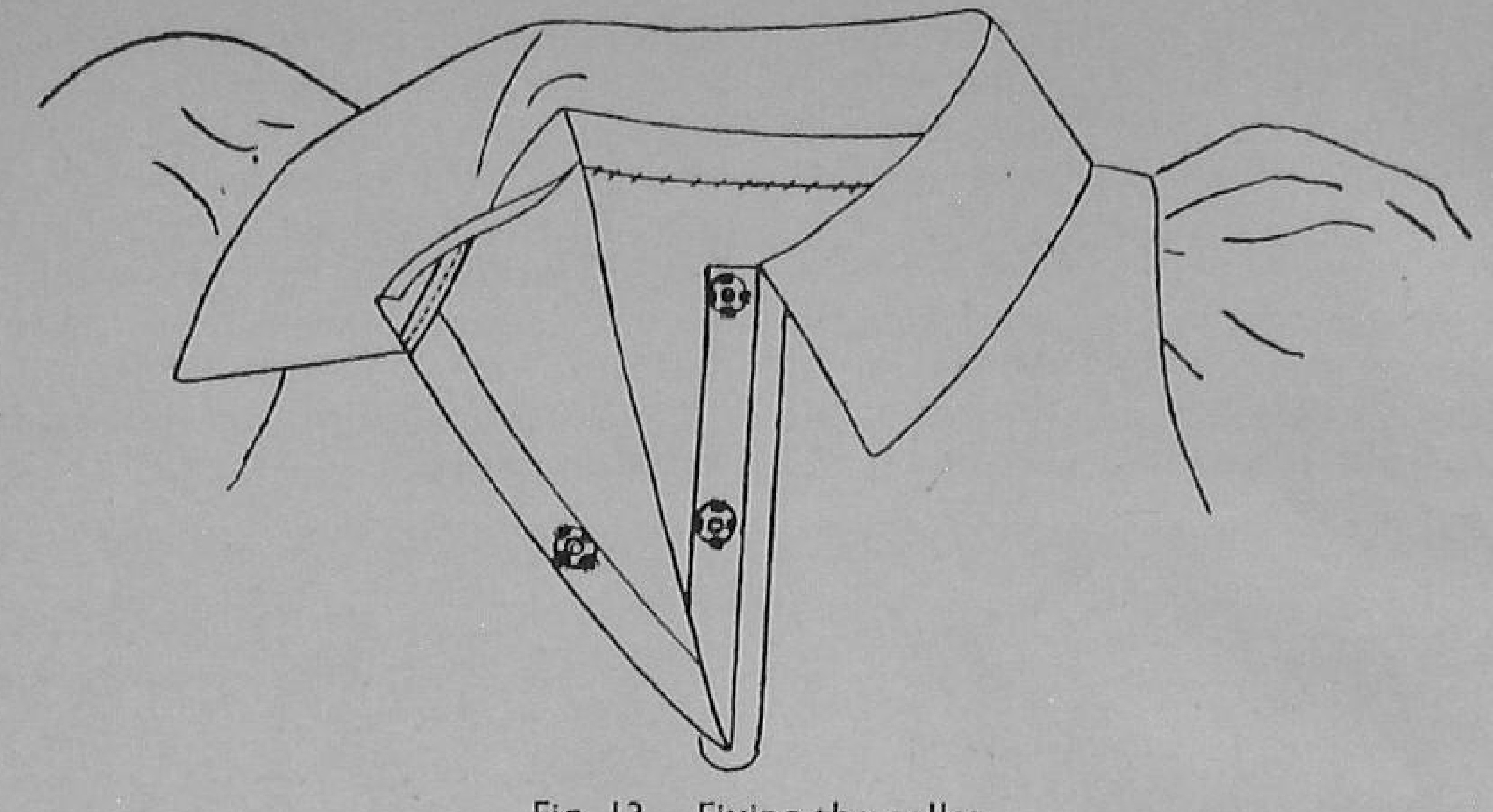


Fig. 13. Fixing the collar

neck-ends of the collar come to the outer edges of the binding of the slit and the centre of the collar coincides with the centre of the back neck. The circumference of the neck-end of the collar will be slightly smaller than that of the neck of the frock. This extra material of the neck should be adjusted neatly at the back for the good fitting of the collar. Fix the collar to the neck with bias a strip of material which should run up to the end of the button-band, fixed to the slit (See Fig. 13). Sew the required number of buttons for the front-opening and finish the frock.

The remaining part of the saree with the border can be used for making an Indian skirt, and a nice *choli* or jumped can be made from the *pallav*.

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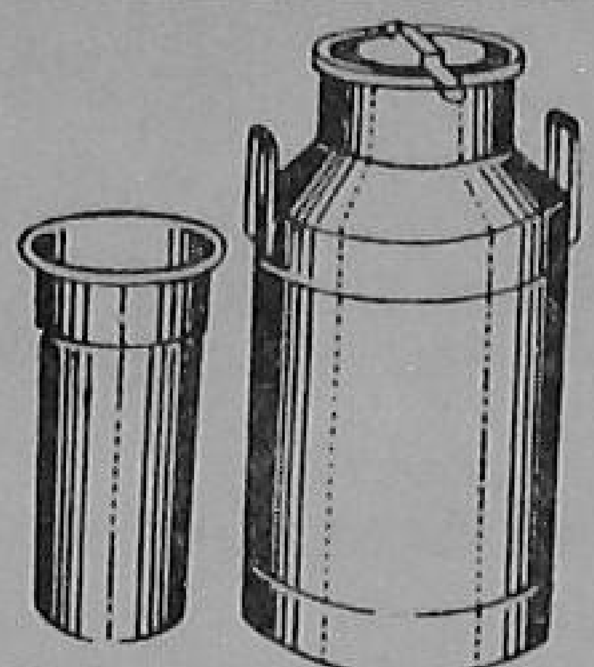

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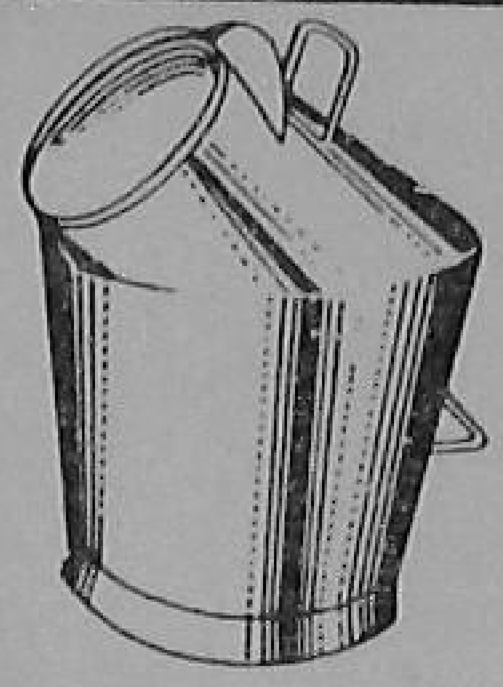

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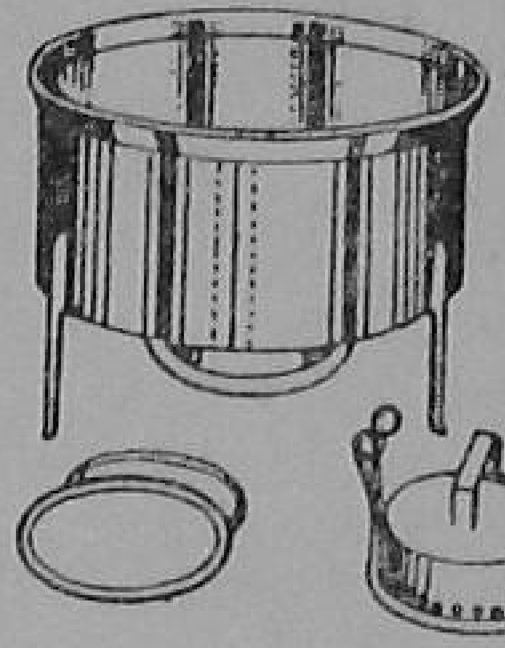

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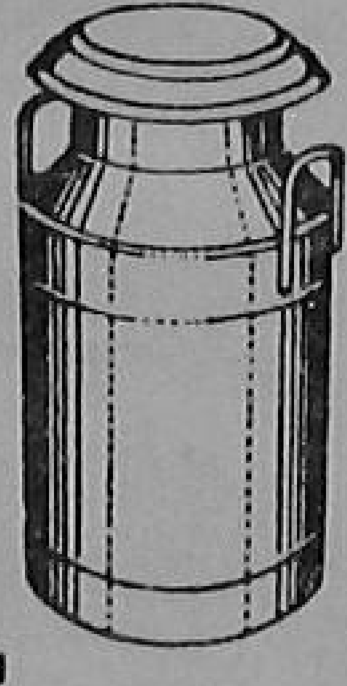

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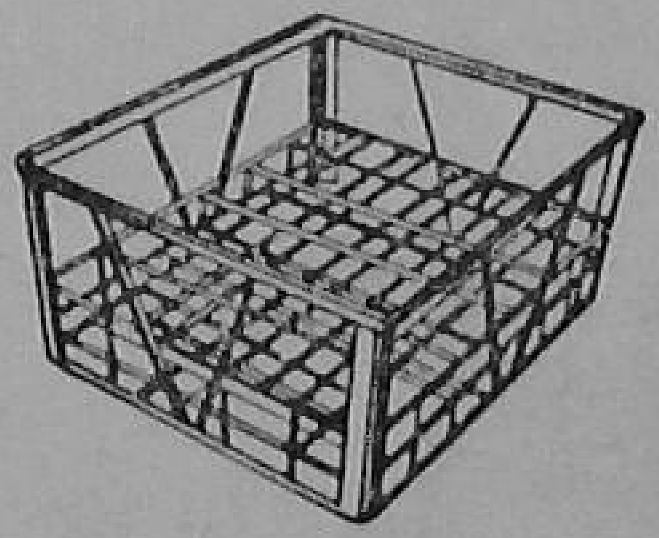

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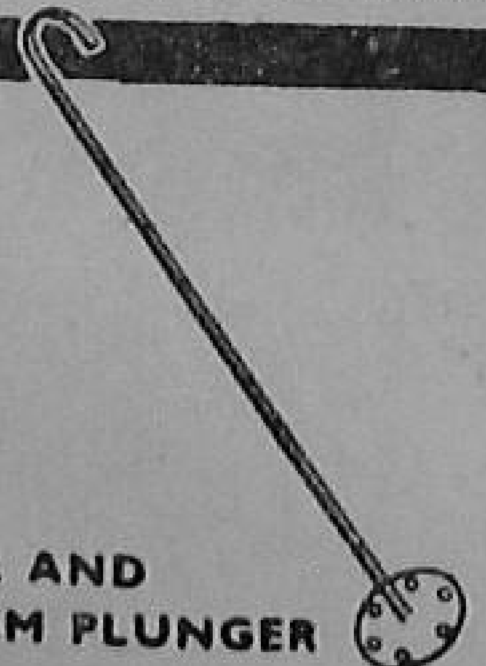

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